CHEMICAL MARKETS

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Synthetic Alcohol

As is commonly the case when land and laboratory come into direct competition, the core of the problem is economic rather than technical. The synthesis of ethyl alcohol is not new. Several different methods of manufacture—practical enough from a strictly technical point of view—have been common knowledge for a number of years. They must compete, however, with a simple, fairly efficient fermentation process using as its principal raw material a waste product. Such competition involves some complex chemical economics wherein is to be found the nub of the matter.

ANY proposed competitor of fermentation alcohol must first find the answer to the perplexing question: What is the lowest price the Cuban sugar planters will accept for their waste blackstrap? Having determined this rock bottom of cost for its natural competitor, can synthetic alcohol prove its ability to meet the corresponding selling price in the open market?

MOLASSES is one of those troublesome wastes not easily disposed of, for it cannot be dumped on the land, poured into the streams, nor burned. Before alcohol created a market, the old practice was to dump it a mile out at sea. Not so long ago the planters were delighted to sell it for a cent a gallon. True, a secondary market has been developed by the cattle feed mixers; but this is a doubtful peg for the bottom of molasses prices if faced with severe competition.

NOR can we forget that this problem in chemical economics is gravely complicated by political entanglements. Any tariff on molasses, designed to help the American farmer by forcing the alcohol industry to use corn, would put the fermentation process in the economically unsound position of being forced to use a foodstuff instead of a waste as its raw material. Such a tariff would rather obviously hasten the day of synthetic alcohol, and looked at broadly, would be a greater help to chemistry than to agriculture.

OVER and over again the invasion of a natural material's market by a chemical product has hinged upon this matter of price. It is the critical point. Many natural products have been synthesized in the laboratory which have not yet been produced in the chemical plant. A complicated chemical structure or a limited commercial demand will long keep many of these out of production. Neither factor holds good, however, in the case of ethyl alcohol.

"OH, Susannah, don't you cry for me, I'm off to California with my wash bowl on my knee!" And to the rallying cry of this popular ditty thousands of gold-seekers thronged to the new El Dorado. Gold long had been known to exist in California, but the first bewilderingly rich deposit was not discovered until January 24, 1848. News traveled slowly in those days, so the rush to the diggings did not start until 1849. The "Forty-Niners" laid the foundation for the tremendous development of the Pacific Slope.

"See American First"

MUCH attention is being given these days to the elimination of waste. Great industrial forces are back of the movement, for its accomplishment will result in obvious advantages.

The selection of quality Alcohol, as a process material, has a direct bearing on the elimination of waste. Therefore, in filling your requirements, it pays to "See American First."

"American" Alcohol is maintained at a high standard of excellence. This fine quality is unvaryingly uniform. And contributing to this satisfactory standard is an exclusive distillation process, originated in our laboratories.

This is number 9 of a series depicting historical periods in the development of America

"SEE AMERICAN FIRST"
COMMERCIAL ALCOHOL CORPORATION
420 Lexington Avenue, New York, N. Y.

Plants:
Pekin, Ill. Gretna, La. Philadelphia, Pa. Sausalito, Cal.

ANNOUNCEMENT

The Kessler Chemical Corporation has been formed to take over the business of the present well known Kessler Chemical Co., of Orange, New Jersey.

The new corporation is a subsidiary of the American Commercial Alcohol Corporation.

The products of the Kessler Chemical Corporation will be distributed by its own sales organization and that of the American Commercial Alcohol Corporation.

SOLVENTS and PLASTICIZERS for the LACQUER INDUSTRY

Ethyl Acetate	Butyl Butyrate	Dimethyl Phthalate
Butyl Acetate, Nor. and Sec.	Ethyl Lactate	Diethyl Phthalate
	Butyl Alcohol, Sec.	Diamyl Phthalate
Amyl Acetate	Amyl Alcohol	Dibutyl Phthalate
Butyl Propionate	Refined Fusel Oil	Dibutyl Tartrate
Amyl Propionate	Butyl Stearate	Triacetine

Special Solvents and Plasticizers

Warehouse stocks carried at all principal consuming points

AMERICAN BRAND DENATURED ALCOHOL

Colonel Donovan's Suggestion

Setting up special courts to deal with the legal phases of mergers, as Colonel Donovan suggests in an article on another page of this issue, appears at first glance to be a step in the right direction. But it is a step to be taken only with extreme caution until we may be reasonably certain just what that direction will be. For such a step would be followed by others along the same path, and that path diverges somewhat sharply from the course of our present, well tested legal organization.

Specialized courts to administer specific sections of the law are not new. The Admirality Courts are ancient institutions. Quite recently the Childrens' Courts have scored conspicuous success in most efficiently administering the matters assigned to them. However, any general redistribution of our legal machinery though an extension of this specialization of court function would involve some serious and fundamental considerations not to be brushed aside because of expediency arising out of a special, pressing problem. There are great advantages in specialization in this complex civilization of ours; but the peculiar disadvantages of specialization are also patent, rather notably so in the administration of justice.

The Erring Mrs. Willebrandt

Such ignorance of conditions in the industrial alcohol industry and the workings of the Bureau of Prohibition itself, as displayed by Mabel Walker Willebrandt is almost inconceivable. In the chapter entitled, "The Big Leaks: Alcohol" in her story, "The Inside of Prohibition," Mrs. Willebrandt endeavors to throw a large share of the blame for the supplies of bootleg alcohol upon the shoulders of the alcohol industry, and in the process, shows herself to be entirely without knowledge of the facts. For example, she asks the rhetorical question:

> Would it be unfair to the legitimate alcohol companies, anxious to keep a legitimate business, to restrict the amount they can manufacture to some figure reasonably near the actual needs of the country?

Dr. Doran must feel hurt, to put it mildly, to discover that the quota plan which he worked out with the co-operation of the alcohol industry, and which set a limit on alcohol production, has not as yet come to the attention of the former Assistant United States Attorney General in charge of Prohibition Cases. But, after all, it is only in its second year of operation.

It is possible to point out instance after instance of misstatements and mistaken conclusions set forth by Mrs. Willebrandt in her article, so that it becomes well-nigh impossible to believe that she could have been so ignorant of the true facts. Perhaps the real explanation lies in her mental attitude as revealed by:

> Every permittee, when he makes application under the law, asks the government for a privilege. It is a valuable privilege. He expects to make money out of it. To get that privilege he enters into a contract with his government.

This extreme misconception of the intent of the law with regard to legitimate business is far too common with a certain type of Government official. Producers of alcohol are not in business by virtue of a privilege but by reason of an inalienable right. Only in the mind of a dry fanatic, steeped in prohibition propaganda, is such a distorted viewpoint possible.

The Golden Goose

Having checked a tariff proposal which would have stepped up alcohol production costs to a level quite out of keeping with sane economics, through an almost prohibitory import tax on molasses, the alcohol industry faces another foe. The new attack comes from abroad in the form of the Bello bill to tax molasses exports from Cuba by providing for an export excise of 1½ cents per gallon. The Cuban Senate has already passed the bill and it needs but the approval of the Cuban House to make it law.

The man who killed the goose that laid the golden eggs naturally comes to mind. In fact, he stands out in sharp relief in the light of the recent announcement of the production of 48,000 proof gallons of ethyl alcohol synthetically through the conversion of ethylene gas.

Perhaps the Cuban legislature will heed the warning so clearly conveyed. It has happened before the governmental restrictions on a natural monopoly have been followed closely by government subsidies to foster and protect that same monopoly against synthetic rivals, whose development had been hastened and encouraged by such economic measures as those identical restrictions.

Quotation Marks

There is a tendency to-day to overrate the value of money rather than the value of life itself; people are rather apt to look at industry merely from the financial point of view and not from the human side. We do not wish to see our industries becoming dehumanised. I hope that the old family business spirit will never be lost. I have endeavoured to keep, as far as is humanly possible, in contact with the workers, by means of works committees and councils. To obtain the willing and loyal co-operation of those engaged in the daily work of the factory is of inestimable value; accountants do not know of it, and taxing authorities—thank heaven—can never tax it. I am sure that the genuineness which characterizes our people will enable us still to keep the old traditions under new methods. By that means we shall settle some of the most difficult problems by the harmonious co-operation of all concerned in industry.—*Lord Melchett.*

The American atmospheric nitrogen industry has been developed on a firm foundation. Numerous plants have been erected in various sections of the country. The technique of manufacturing on a commercial scale has been mastered. The American industry, could, if necessary and economically feasible, build additional plants to free the consumer of imports of foreign nitrogen. The supply of nitrogen in the atmosphere is inexhaustible and our natural resources of coal, oil, and gas could be employed to fix the atmospheric nitrogen in a form suitable for use in agriculture or industry.—*Dr. Julius Klein.*

I am an agriculturist and a disciple of Gilbert and others. We compass sea and land in order to get manure to make our products grow. And what is manure? It is an impure form of the carbon and nitrogen in which those products are bathed in the circumambient air every day of their lives. I trust that the chemistry of the future may tell us why we have to go to Chile and why we cannot take them from the air around us. I believe that these and other problems are now approaching nearer to their solution than ever they were before.—*Marquis of Salisbury, February 25, 1891.*

The Chilean Government has already committed itself to do everything within its power to maintain and expand its nitrate of soda industry.—*Don Pablo Ramirez.*

The United States Government should encourage, not throttle, private enterprise in the remarkable progress it has already made in nitrogen fixation.—*Charles J. Brand.*

The function of applied chemistry is the development and control of processes, for it is through processes that we pass to the products we desire. The factors involved in process development are therefore of primary importance to the chemical engineer who must develop the process, to the financier who must supply the funds for the development, and to the manufacturer who must operate the process in the form which it finally assumes. The interest of the general public, though less direct, is no less real, since the price which it must ultimately pay for the products it wants is largely determined by the efficiency of the processes by which they are produced.—*Arthur D. Little.*

The European cartel is slowly developing strength and mastering the overpowering political, racial and traditional attitudes which hamper it tremendously. It is slowly conquering one obstacle after another, even though negotiations appear to break down and a stalemate results occasionally for a year or two.—*J. George Frederick.*

The real chemist is not a salesman. By that sign alone you can tell him from the "wizard." His work saves money in business, but he seldom talks about money—it is the work that interests him.—*Arthur R. Maas.*

Ten Years Ago

(From our issues of September 1919)

Robert I. Wishnick, general manager, A. Daigger & Co., Chicago, was elected vice-president of the organization.

W. F. George Chemicals, Inc., New York, increased its capital stock from $10,000 to $15,000.

Monsanto Chemical Co. secured contract as sole selling agent for 30,000,000 pounds of phenol for the War Department.

United States Shipping Board contracted for the shipment of 10,000 tons of potash from Germany, said to be the first since 1914.

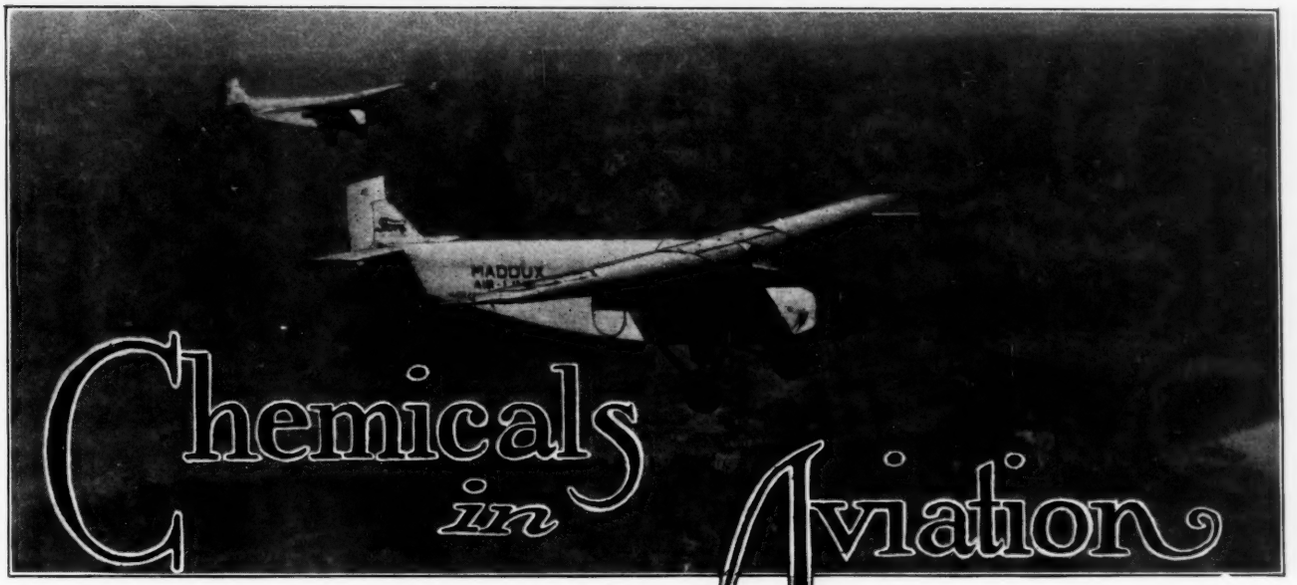
Union Carbide Co. purchased twenty-one story office building on southwest corner of 42st. and Madison ave., New York. Building is valued at $7,000,000.

Frederick H. Chamberlain, formerly with the Calco Chemical Co., was elected president of the Heyden Chemical Co.

Wood Products Co., Charleston, Miss., placed in operation its $500,000 wood chemical plant. H. E. Gaffney, Bradford, Pa., was president of the company.

Southern Agricultural Chemical Co. acquired 56-acre site at Atlanta upon which to erect its first chemical plant.

General Alcohol Export Corp. was formed with capital of $100,000 by E. W. Wilson, F. M. Harrison, and J. Kessler.



Chemicals in Aviation

By Donald M. Liddell
Major, Air Reserve

TO use the catch phrase of the publicity man and of the aeronautical securities salesman, "we are becoming air-minded." The daily commercial flying in the United States is approximately equal to twice around the earth. Scarcely a mail arrives that does not bring a letter with an air-mail cover, and for those of us with foreign connections, queer designs in stamps from such far-away places as Siam and Persia show that the letters made the first stages of their journey from some strange up-the-river point by air mail. What harvest is the chemical manufacturer reaping from all of this aviation activity ?

While aviation gasoline is itself a product of chemical engineering skill, the oil companies obtain the full benefit of the fuel consumed in aerial activity, if one excepts the negligible amounts of dye going to color aviation gasoline. (This is done simply to make plain to anyone using it that he is dealing with a high-test gasoline, and that it is not to be used for ordinary purposes, such as cleaning gloves.)

Apart from the gasoline and those supplies used in metallurgical operations and not appearing in the finished plane, probably the most important factor contributed by the chemical industries is airplane dope. The original Wright planes followed what had been Lillienthal's practice in making his gliders, and Langley's and Sir Hiram Maxim's in their experiments with heavier-than-air engine-propelled flying machines; that is, the various textile surfaces, were of muslin or silk stretched over the ship's skeleton. Shortly before the war dopes came into use for airplane fabrics.

These served a variety of purposes. In the first place they produced a certain shrinkage of the fabrics which rendered it unnecessary to stretch them initially as tight as had theretofore been necessary. This allowed the employment of less skilled labor in the manufacture of the planes and yet produced better surfaces than had been available before the use of the dopes. At the same time friction between the air and the cloth surfaces was greatly reduced, thus vastly increasing the speed of the plane and decreasing the fuel requirements. It also greatly lengthened the life of the cloth surfaces.

These airplane dopes were of many compositions, but all followed certain general lines: there were some low-boiling-point solvents, some high-boiling-point solvents, a main basic material, either cellulose acetate or cellulose nitrate, a plasticizer, and in case the dope was "pigmented", a mineral pigment to absorb the actinic rays, and thereby increase the life of the innermost coats of non-pigmented dopes and of the fabric itself.

The favorite low-boiling point solvents are acetone, methyl-ethyl ketone, dimethyl ketone, benzol, and methyl and ethyl acetates. So far as Government specifications are concerned it is believed that benzol will shortly be dropped from the list, although this will affect the chemical industry as a whole, favorably rather than otherwise. The solvents of higher boiling point are usually butyl acetate and diacetone alcohol. The various acetates in turn mean a demand for the corresponding alcohols and for acetic acid, although it is understood that one manufacturer is fractionally fermenting ethyl alcohol to acetic acid and distilling off ethyl acetate from the fermented mixture as a continuous process.

Of the plasticizers probably the best known are triphenyl phosphate and dibutyl phthalate. The former creates a demand for phosphorus trichloride and phenol; the latter for butyl alcohol and phthalic acid.

Finally, as already stated, the real basis of the dope is either cellulose nitrate or cellulose acetate. The nitrate appears to have the preference at present. While there are many dope makers that claim the

nitrate dopes are superior in resisting decomposition, both of themselves and of the coated fabric, the probability is that price is the controlling factor.

Cellulose nitrate uses for its raw materials cotton, sulfuric and nitric acids. Cellulose acetate requires, in addition to cellulose, the comparatively expensive acetic anhydride. It is true that we have heard many whispers recently of the catalytic production of acetic anhydride from glacial acetic acid, but so far the price of acetic anhydride has remained fairly steady and always high, and as it requires about four pounds of the anhydride for each pound of cellulose acetate produced, cellulose acetate likewise has remained high priced as compared with cellulose nitrates

Apart from any advantages in manufacture of the latter commodity, there has so far been a large amount of scrap cellulose nitrate moving-picture film available, which, after having the emulsion scraped off, in order to recover the silver in it, is used for the manufacture of lacquers and dopes.

Donald M. Liddell

Whether this scrap market will be changed by the recent Cleveland hospital disaster remains to be seen. There is little question that film which is to be part of a permanent record should be of cellulose acetate. On the other hand it appears that in the first few weeks of its life before the cellulose-nitrate film is completely dried out, it does not constitute a great hazard. This means that safety conditions alone would probably allow the continued use of nitrate film in news reels and other ephemeral films, and it is of course the news reels that are quickly discarded and now form the bulk of the scrap sold.

But a fundamental change can be made in this market by legislative enactment, in case the state wishes to play safe by banning the use of cellulose-nitrate films entirely. This would set free a certain supply of cellulose-nitrate that is now used by the film makers, against the decrease in the scrap cellulose-nitrate that would ensue. It would bring into the market a tonnage of acetate scrap equal to the nitrate scrap now used, and would probably swing the tide of favor back to the acetate dopes.

Another war would decidedly change the present trend. Apart from creating a demand for nitrating capacity for explosives manufacture, even were cellulose acetate and nitrate equally plentiful, the acetate would be preferred because of its smaller inflammability when hit by incendiary bullets.

The use of phenol in air-craft production in the form of triphenyl phosphate has already been mentioned. It also enters, in a minor way, in the various condensation products (bakelite and the like) used in switch board panels and other fittings.

Waterproof glues (casein glues) are other chemical products that have played an important part in aircraft development. They are used in making the plywood which has been the leading material for stream-lining fuselages and nacelles and in the construction of cabins, wing ribs and the like. This, however, we view as a material that will be used less as the air-craft industry grows, rather than more. The trend in construction seems to be decidedly toward the all-metal plane, which means less plywood used.

The chemical trade contributes to the safety of commercial night flying with its flares and signals and in war contributes to the discomfort of the evening by the same means, but most of these colored fires seem to have been inherited from the Alchemists and the purely empirical workers of past times. It is far otherwise with some of the alloys developed for aircraft use.

When the first Zeppelin was brought down in England, there was the utmost haste to test and analyze the alloys used in it and the analytical information was quickly distributed. It was quickly found, however, that the composition was only half the story, and that the correct heat treatment was an equally great factor with the correct proportioning of the alloy. So while the alloys stand as tributes to the skill of the research metallurgist, the chemical trade contributes nothing except the salts used as covers, quenching baths and fluxes. The alloys are chiefly of aluminum, zinc, copper and magnesium, with small amounts of iron, manganese and silicon, none of which is added as a chemical.

The same is true as to the marvellously resistant chrome-nickel-tungsten steels for valve-seats and similar parts—the smelter and the metallurgist are chiefly responsible for them.

But to close the review, we must credit the chemist with the latest triumph in distinct advances. The use of the new radiator mixture, ethylene glycol, takes about seventy-five pounds off the dead weight heretofore necessary for a water-cooled engine. For high flying it removes the problem as to freezing and in every way makes the pilot's life a happier one, except perhaps in the ability to drink the radiator contents after a forced desert landing.

Showa Fertilizer, new Japanese ammonia merger, expects to manufacture 50,000 tons of ammonium sulfate next year followed by annual production of 100,000 tons in succeeding years. This company will use in its production of sulfate of ammonia the Shibata patent owned by the Department of Commerce and Industry. It is believed that this process will enable the company to produce a ton of ammonia at a cost of 60 yen, thus effecting considerable savings in eliminating royalty to foreign owners of existing patents. It is said that this decision came after an exhaustive study of various well known patent processes in Germany and Italy by the executive director of the company. Because of this decision the company will forfeit 150,000 yen, which had been put up for the Japan rights of the Uhde patent, and it will not accept the proposal of the Fauser patent owners for a joint Japan enterprise, using that patent, reports the Department of Commerce.

Foreign Relations *and our* TARIFF POLICY

By Carl R. De Long*
Mutuelle Solvay of America, Inc.

THERE is a decided difference in tariff policies here and abroad. In the United States duties are assessed for two fundamental reasons—to protect domestic industries from foreign competition and to derive revenue. In European countries in addition to these purposes, duties are often levied to place the particular country in a position to bargain or trade with other countries so as to obtain some special tariff advantage for certain merchandise which is an important export item. This policy is frequently referred to as the bargaining tariff policy of Europe. The tariff history of European countries shows that this bartering process has constantly and considerably increased in importance. As a part of this policy different rates of duty are made to apply against the same goods from different countries. In contrast to this the United States has adhered for the most part to a policy of applying the same rate against goods from all countries. It must therefore be realized that two fundamentally different principles of tariff making are involved.

Under the European bargaining policy, most of the European countries have some form of multiple schedules of tariff rates; such as, the general and convential system and the maximum and minimum systems. The single schedule system of tariff rates as practiced in the United States is found only in a few countries of Europe which are either free trade countries or countries of minor commercial importance. The convential and minimum rates apply to countries with whom special treaties have been made usually in exchange for special tariff favors. The general or maximum rates are applied to those countries which impose equally artificial rates and from whom concessions are desired in return for granting the application of lower rates of duty. These bargaining rates bear little or no relation to the actual need for protection; having thus penalized in advance the commerce of other countries so-called concessions are granted and finally there is reached bona fide protective or revenue rates. Tne whole system is one based on trading and bartering, the best manipulator securing the greatest concessions and tariff favors. All of this jockeying of course is to obtain the best possible advantage for the foreign trade of the particular country.

The representatives of European governments engaged in and accustomed to this sort of tariff bargaining are unable to understand the aloofness of the United States toward this policy. They cannot see why we should not sit across the table and swap horses with them. When told that the United States is following a policy of equality of treatment in the matter of tariff duties they reply that the duty on a particular class of goods in effect applies to a specific country and therefore it should be a subject for discussion between the governments of the two countries. There is some merit to this contention especially in view of the principle which has been laid down by Congress in the flexible provisions of the Tariff Act of 1922 which provided that the rate of duty shall be based on the differences in costs between the United States and the principal competing country, which is usually the foreign country with the lowest cost of production. They argue that the rate so arrived at discriminates against all other countries producing the commodity in question. While on the surface this appears to be a well founded criticism, I do not believe it justifies our departing from our

*Abstracted from an address presented at the Institute of Politics.

established policy. From a national standpoint the application of equal duties to the goods of all countries appears to be the best in the long run, as it will result in the least international friction. Under it we seek no special favors and grant no special favors.

If we are to continue with this policy, the question arises as to how we can protect ourselves from the high bargaining rates of European countries. In other words, how can we secure for our exports equality of treatment as compared with goods from competing countries. The Tariff Commission after a careful study of this situation recommended in 1919 the early enactment of legislation authorizing the imposition of new or additional duties at the discretion of the President as the best method of securing fair treatment for the trade of the United States. These recommendations were embodied in the Tariff Act of 1922 in Section 317. It gives the President the power to levy new or additional duties (not exceeding 50 per cent ad valorem or its equivalent) against the commerce of any country which discriminates against the trade of the United States. This Section may be designated as a warning to other countries not to apply to American products the same exaggerated bargaining rates they apply to products of countries which meet their high rates with equally artificial ones. While these provisions may appear unfriendly, it should be remembered that they are to be used only as a basis for securing equality of treatment for our own goods and are therefore of a temporary nature. Any additional duties imposed may be terminated when the desired effect has been attained. In fact it may not be necessary to impose additional duties, the mere suggestion that such provisions can be employed in many cases will be sufficient to secure the desired objective. It is stated in the last annual report of the Tariff Commission that the President has secured the removal of important discriminations without actually imposing retaliatory duties. There are apparently no cases on record where additional duties have been applied under these provisions.

Effect on Export Trade

The bargaining tariff policy of European countries is designed primarily to improve the export trade. In this country little consideration has been given in past tariff revisions to the effect of customs duties on our foreign trade. The primary emphasis has been on the relation between imports of foreign goods and domestic production and the imposition of duties on articles of a luxury nature for revenue purposes. If we are to maintain the increasing trend of our export trade greater consideration must be given in the future to the relation between import duties and exports. We cannot expect to raise the level of import duties, diminish imports and continue to sell more goods to foreign countries. We will have to decide upon a policy to be followed.

While it is true that our exports of five billion dollars are only about eight per cent of our total manufacturers, there are several industries which are pecularily American and whose ration of exports is much greater. Shall we frame our future tariff policies so as to promote the export trade in these manufactures or shall we continue our past policy of disregarding the effect of tariff duties on these exports ? This question must receive serious consideration in future tariff revisions.

Another factor is foreign loans. These will have a tendency toward a moderation of our scale of tariff duties.

The Flexible Tariff Experiment

For the past seven years we have been experimenting here in the United States with a new method of adjusting tariff duties. This method is embodied in Section 315, the so-called flexible tariff provisions of the existing tariff act. The purpose was to meet changing economic and competitive conditions by adjustment of rates on individual commodities as conditions warranted by giving the President power to increase or decrease duties by 50 per cent of those specified in the tariff act. The basis for such changes was to be the differences in costs of production as between this country and the principal competing foreign country.

Experience has shown that the determination of tariff duties on the basis of a cost of production formula involves many difficulties. First, many of these problems are inherent in the matter of determining costs. What items properly make up costs ? Shall interest on investment and transportation costs to market be included as items of cost ? What methods shall be used in determining the cost of by-products and joint-products ? What proportion of the industry shall be represented by the unit cost to be used for comparison ? Shall it be that part represented by the weighted average cost which is usually not much over 50 per cent of the production, or shall it be some arbitrary proportion between this and 100 per cent of the industry ? Secondly, the problem of ascertaining costs in foreign countries is even more difficult. Here agents of the government can secure only such data as foreign producers are willing to make available. There is a natural distrust as to whether such data is made available will not eventually find its way into the hands of their foreign competitors. Manufacturers abroad are not required to submit such information to their own governments let alone to representatives of a foreign government.

These difficulties inherent in the law itself and a marked divergence of opinion among the members of the Tariff Commission have rendered investigations under the flexible tariff extremely tedious and long-drawn out. It is the exception rather than the rule for an investigation to be completed and a rate changed in much less than two years unless there is some good political reason for more speedy action.

In place of foreign costs of production the Tariff Commission in many cases has resorted to the use of invoice prices as an indication of foreign costs. In fact the Attorney General gave as his opinion that invoice prices could be used under the law as evidence of foreign costs of production. This theory is based on the assumption that the invoice price includes a margin of profit. In cases where the difference between the invoice price and the domestic cost shows that the maximum increase in duty is justified it can then be used with a fair degree of assurance. It at least puts the burden of proof on the foreign producer to show that it is not representative if the cost of production.

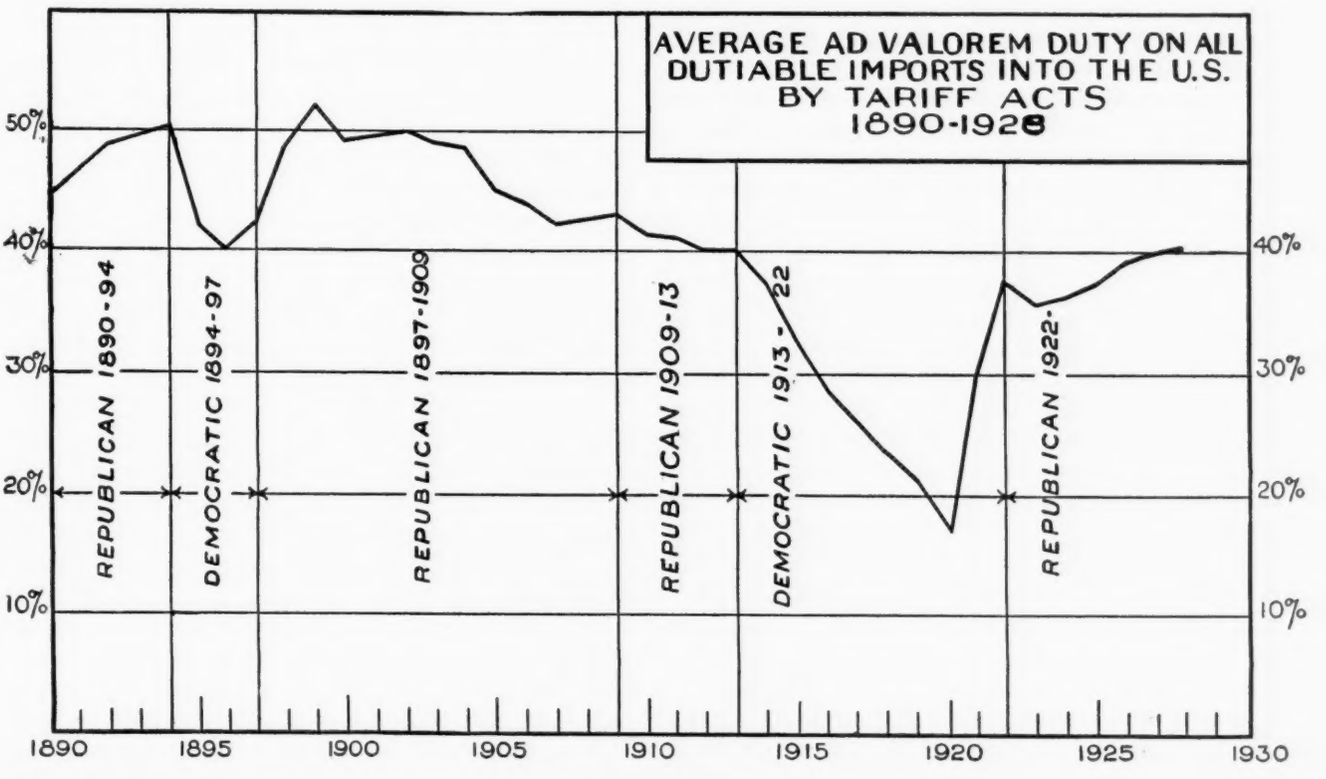
Since experience has demonstrated the impossibility of the flexible tariff idea based on differences in costs, the House of Representatives has proposed to modify the formula and has substituted "differences in conditions of competition" as the basis for adjusting tariff rates. This is no new idea. It was the basis on which the flexible provisions of the present act were originally drafted by the Senate Finance Committee and reported to the Senate itself. The provisions met with so much opposition that an amendment substituting differences in cost of production was offered and passed by the Senate and became the flexible provisions of the existing tariff act.

A flexible tariff based on "differences in conditions of competition" would be subject to wider differences of opinion than the existing law. This change would appear to increase the difficulties of administering a flexible tariff rather than simplify it. Unless some more definite basis can be found than this the whole flexible tariff idea better be abandoned.

When the idea of equalizing conditions of competition are analyzed the problem narrows down to one of price. Price and price alone determines competition, costs may or may not be involved. The domestic producer is not particularly interested in the costs of his foreign competitor but he is vitally interested in the price at which he is willing to sell his goods in the markets of the United States, for this is the price he must meet in selling his goods.

A flexible tariff based on a comparison of the delivered price of imported products with costs in the United States with an allowance for a reasonable profit would appear to be more practicable than either costs or the vague expression "conditions of competition."

The bill as passed by the House of Representatives still leaves the final decision as to a change in duty in the hands of the President. While the President under the law cannot make a change in duty until the Tariff Commission has made its investigation and report; on the other hand, the President is not required to make any change in the duty, even if a change is clearly indicated by a report of the Tariff Commission. Any change in the duty is entirely discretionary with the President. This is a weakness in the law as it leaves any change in duty entirely in the hands of one person who is subject to great political pressure. If for no other reason than political expediency the President deems it advisable no change in duty need be made. Cases such as this have occurred in the past. If this weakness can be corrected it will be another step in removing tariff duties from the realm of politics.



The whole flexible tariff question has involved a difference of opinion as to the constitutionality of Congress delegating its tariff making duties. The Supreme Court has upheld the present delegation of power to the President. It would therefore appear that these duties can be delegated to an independent Commission. The only suggestion which has been made that would remedy this situation is to delegate the power to change duties by proclamation to the Tariff Commission itself, with any change subject to review and approval of Congress.

The Tariff Commission and the Flexible Tariff

The experience of the past seven years has shown that a Commission whose membership is equally divided on bi-partisian lines cannot function efficiently and expeditiously in the administration of the flexible tariff provisions. While the operation and administration of the flexible tariff cannot be labeled as a complete failure, it has not lived up to expectations. This has been due primarily to an even party division within the Tariff Commission itself, which resulted in the Commission being unable to agree upon fundamental principles and has prevented the establishment of a formula to be followed in ascertaining differences in costs of production. Each case has been considered as a separate proposition. The only way the Tariff Commission can function efficiently is to be so organized that general principles can be laid down which can be followed by its staff in all cases.

In the new tariff bill as passed by the House of Representatives it is proposed to reorganize the Tariff Commission by creating an entirely new Commission of seven members. The term of each member is to be seven years with the term of one member expiring every two years. Under this proposal it will be possible for a majority of the members of the Commission to be in harmony with the administration in power. I believe that this is the only way in which the Tariff Commission so long as it has administrative functions under a flexible tariff can be made to operate efficiently. With a Commission organized so that the majority of the members are in harmony with the administration the responsibility will rest directly on the administration in office; there will then be no grounds for excuse or long drawn out investigations. There is no apparent need of increasing the membership of the Tariff Commission from six to seven members. Five members would be sufficient to carry on the duties of the Commission. It would be much better to have five members with still higher salaries which would attract men of greater capabilities to the position.

While the reorganization of the membership of the Tariff Commission is a step in the right direction, there is still much left to be done to make the Commission function efficiently. The rules of procedure of the Commission are in need of revision, and its internal organization could well be remodelled along the straight line production principles of industry so as to speed up its investigations.

Tariff Activities Abroad

The activities of representatives of the Tariff Commission under the "flexible" tariff provisions and of the agents of the Treasury Department in determining the proper valuation of imported goods for the assessment of ad valorem duties have aggravated relations between the United States and foreign countries. From the standpoint of European countries, the investigations of the Treasury Department have been the more obnoxious because of the powers which the Department has to exclude from entry into the United States the products of any firm which refuses to allow inspection of its records. The Tariff Commission has no such powers; it is purely voluntary with foreign manufacturers whether or not they submit data upon costs of production required under the flexible tariff provisions.

These tariff investigations abroad have resulted in numerous protests from various foreign governments. It has been asserted that these requests for access to prices and costs are outside the rights which the governments themselves possess. Individual manufacturers abroad are fearful lest such information be made available to their own governments or to their competitors in the United States. While these fears for the most part are unfounded, the whole situation has resulted in making more difficult our relations with foreign countries. A change in the flexible tariff as indicated above and the assessment of ad valorem duties on values determined in this country would permit of the withdrawal of tariff investigators from foreign countries. This step would do much to improve our foreign relations.

Basis of Valuation for Ad Valorem Duties

There has been much comment and discussion in the public press as to possible increase in tariff duties due to the assessment of ad valorem rates on United States value. The general impression created is that the present tariff bill contemplates the assessment of ad valorem duties on United States value rather than on foreign values. The new tariff bill as passed by the House carries no basic change over the act of 1922 now in force. Ad valorem duties if this bill becomes law will still be assessed—first, on the foreign value or export value, whichever is higher. If neither of these values can be ascertained to the satisfaction of the appraiser, then upon the "United States value" which is the selling price of the foreign article in the United States less certain deductions specified by law. If neither the foreign value, export value, or United States value can be ascertained, then the ad valorem duty is to be assessed upon cost of production. These provisions represent no basic change over the act which has been in force for the last seven years.

The only suggestion of a change in the basis of valuation in the bill as passed by the House is contained

in Section 642 in which the President is requested to make a survey of the basis for valuation of imported merchandise, primarily with a view of determining the extent to which values in the United States may be used as a basis for assessment of ad valorem duties. The President is requested to submit to Congress a report on this investigation including any formula he may propose for adjusting the rates of duty to conform to any change in basis of valuation he may recommend.

Foreign Valuation Difficulties

Agitation for a change in the basis of valuation for ad valorem duties was first actively brought forward during the framing of the Tariff Act of 1922. At that time it was suggested that ad valorem duties should be based on the selling price of comparable American goods. This suggestion was severely criticised as a means of increasing tariff duties by changing the basis of valuation. While certain investigations were made by the Tariff Commission and the customs division of the Treasury Department as to the relation between foreign and American values, the information obtained was inadequate for making a complete change from foreign to American valuation. The present bill contemplates a thorough investigation of this subject before any change is made in the basis of valuation.

Past experience has shown that it is extremely difficult and in many cases impossible to secure accurate information as to the foreign market value for purposes of assessing ad valorem duties. Too often it has been necessary to accept the statement on the invoice at its face value. In an effort to remedy this situation the Tariff Act of 1922 gave the Treasury Department the power to bar from entry into the United States the goods of any foreign producer refusing agents of the Treasury Department access to their books of record in order to determine the actual foreign market value. Attempts to enforce these provisions brought numerous protests from foreign countries through diplomatic channels against this procedure. As a result these provisions have become practically a dead letter.

The assessment of ad valorem duties on values in the United States would remove the complications which have been encountered with foreign governments in attempting to determine foreign market values. This change however should not be made until after thorough investigation so that accurate knowledge can be had as to the effect the change in basis of valuation will have on the actual duty collected. Such a change would permit the withdrawal of agents of the Treasury Department from foreign countries. The effort and money now spent abroad, if spent in ascertaining values in the United States would result in more accurate values on which to assess ad valorem duties. In such cases agents of the Treasury Department would be operating within our own jurisdiction and would have full authority to examine records to determine the proper value for assessment of duties.

Sufficient experience has been gained during the past seven years in the case of coal-tar dyes and chemicals to demonstrate the feasibility of assessing ad valorem duties on values determined in this country rather than abroad. These products are the only ones in the existing tariff act on which the ad valorem duties are assessed either on the selling price in the United States of a comparable domestic product or if there is no comparable domestic article on the selling price in the United States of the imported article less certain specified deductions; such as duty, transportation charges, commissions, general expenses and profit. At the outset, this change was attended with considerable confusion and difficulty which could only be expected in the case of products so numerous and varying so much in variety and number of brands. However these initial difficulties have been solved and it has been demonstrated that ad valorem duties based on values in the United States can be successfully administered.

Determining Duties on Domestic Prices

In considering the value in the United States to be used as the general basis there are two possibilities as has just been suggested. First, the use of the selling price of a comparable domestic product which is defined in the present tariff act as the "American selling price." Second, the use of the selling price of the imported article in the markets of the United States. This with certain deductions which I have previously referred to, is known as "United States value."

The use of "American selling price" involves a difficult problem of determining comparability between imported articles and articles of domestic manufacture. In certain cases, for example with chemicals having a definite constitution, the problem is not so difficult but with many other articles the question of comparability becomes extremely difficult and is largely a matter of opinion. Personally I do not believe that "American selling price" would be a feasible basis to be generally used for assessment of ad valorem duties.

The determination of "United States value" is a much easier and simpler matter although as defined in the present law it involves many calculations to give effect to the deductions specified and therefore imposes an unnecessary amount of clerical work in its administration. It would appear that a modified United States value, such as the selling price of the imported article c. i. f. United States ports excluding duty, would be a much better value for assessment of ad valorem duties. This is the basis on which imported goods are ordinarily sold and is easy of determination. Furthermore, it makes unnecessary the tedious calculations involved in the present "United States value."

MERGERS and the LAW

By William J. Donovan

An Industrial Court, as additional machinery for the administration of the law regarding mergers and consolidations, is herein advocated by Col. Donovan, who claims that the new problems presented by present industrial developments necessitate new methods of treatment.

THERE should be established a Federal Agency with power to inquire into, consider, and determine in advance the legality of industrial consolidations, or trade agreements affecting competition.

For the purpose of this discussion it is assumed that the Sherman Anti-Trust Act is sound in principle; that it represents a political and social theory as well as an economic theory; that it is a philosophy of human relationship and has for its object conserving the public interest by protecting it from economic exploitation.

Purpose of the Sherman Act

The enactment of the Sherman Law was intended to secure equality of opportunity and to protect the public against evils incident to monopolies and to those combinations which had for their purpose the suppressing of competition. It is recognized that business mergers may be prompted by perfectly proper motives of industrial efficiency and that in order to avoid industrial decay a fair chance must be given for the growth of business units. It has been said that size itself is not an evil and that the mere existence of power that is unexerted does not constitute an offense. Business combinations, to the extent that they advance the interest of economic life, are not condemned, but where the purpose of the consolidation is to control an industry so that a particular group may eliminate competition, destroy individual initiative, and by skillful devices award themselves profits disproportionate to their services, then such combinations constitute a serious economic and social danger.

Criticism of the Sherman Law comes to-day from two sources. First, those who insist that it should be repealed because it constitutes an undue limitation upon industry and a shackle upon the development of business; that it gives no definite rule by which business men may be guided and that this results in confusion and uncertainty. Then there are those who assert that the Anti-Trust laws are not properly enforced, and as proof of their assertion cite the continued growth of industrial combinations.

Those who assert that the Sherman Act should be repealed because it is too general are attacking it in its strongest point, because the generality of its statement gives it a resiliency and power of growth that makes it responsive to changing economic conditions. Many of those who contend that the number of mergers now taking place is proof of the ineffectiveness of the law or of laxity in its enforcement base their contention on the fact that mere consolidation is a violation in and of itself. They forget that many combinations are only the necessary expression of our industrial development. They forget also that tests of legality have been laid down by the Supreme Court.

There is bound to be always some degree of uncertainty—the growth of business will always invade some field not yet delimited by court decisions. Nevertheless, it must be true that there can be elimination of delay and that more quickly the test of legality ought to be applied. But the reason for the difficulty complained of does not really lie in any fault of substance, rather is it a fault of procedure—a need of method in carrying into effect the purpose of the law.

Present Law Inadequate

In its enforcing features the Sherman Law was based upon the idea that monopolies could be prevented and illegal trade agreements thwarted by a system of repressive legislation. It was believed that the effective method was to be sought under the provisions of the criminal law. We have been proceeding all these years upon that theory. We had believed that all we need do in the enforcement of our trust laws was to pursue the conventional method of a public prosecutor, who, acting upon complaint, will submit the case to the determination of a court. But the Sherman Law itself, in fact, was not so much a criminal statute as the definition of a common law policy. The thirty-five years of its existence ought to show that the effective approach for carrying it

into effect is through some preventive method that would arrest the evil before it could work harm.

By the subsequent enactment of the Federal Trade Commission and the Clayton Act it was not intended that the Sherman Law should be affected. That remained as it was. The new legislation was intended merely to supplement that act. And whatever might be said as to the desirability of the new legislation, there still remained the vast field of uncertainty between the definite act of the business man in entering into a combine or a trade agreement, and the act of the Attorney General in instituting proceedings. No agency had been set up to meet the difficulty or uncertainty that would be presented in that field. The Federal Trade Commission Act did not undertake to do so. That Act in its substantive features declared that unfair methods of competition in commerce are unlawful, and the commission is empowered to prevent the use of such methods.

In order to do this it may issue a complaint charging a violation of the Act and proceed to a hearing. As a result of the hearing it may order the person to cease and desist from using such methods of competition. In case of non-compliance the Commission applies to the United States Circuit Court of Appeals for the enforcement of the order. In this proceeding the finding of the Commission as to facts, if supported by testimony, is conclusive, but the court may order additional evidence to be taken before the Commission. The party against whom the order is made may apply to the court to have the order set aside.

The order against unfair methods of competition is not supported by any direct penalty provisions. The Act confers upon the Commission no license power or powers of exemption.

From this summary of the Act it is seen that the Commission was given the power to condemn a certain course of action if it amounted to unfair competition. It was not given the power to examine a proposal of consolidation or trade agreement.

Additional Machinery Seems Necessary

The experience of the Department of Justice during the past few years denotes that it is necessary to set up additional machinery in order to make more effective the administration of the law. What should that agency be and what should be its powers? Certainly it should have no power to make terms with monopoly or in any way assume control of business. But it is believed that it should have the authority to make a declaration as to the legality of a proposed course or agreement. It should not be part of any existing machinery, either of the Department of Justice or the Federal Trade Commission.

In dealing with the problem it is helpful to consider the trend now evident in other countries in meeting it. An examination of the legislation in all these countries indicates that there is a growing recognition of the fact that it is only through administrative regulations that the two principles leading up to the debates in the enactment of the Clayton Act and Federal Trade Commission Act, may be embodied in one, that is to say, may be embodied in an agency that will give industry an opportunity of greater certainty in what it shall do, and the public greater protection in preventing what shall not be done.

Germany furnishes a fine example. It now has a law called "Decree Against Abuse of Economic Power." This in substance recognizes the legality of cartels but requires that they must not be prejudicial to public welfare. Under this Decree a Cartel Court has been established. If an agreement or decision or certain method of enforcing it is considered to imperil the public welfare, application may be made to the Cartel Court to declare any proposed agreement void, or the cartel may be prohibited from carrying into effect any of the objectionable features of the contract. The Cartel Court may order that the agreement be entirely or partially cancelled, or the method of carrying it out be changed. The decisions of this court it is expected will constitute a code of industrial law for the future guidance of cartels. It is this court feature of the German act which merits attention in considering additional legislation in order to meet the defects in administration of the Sherman Law.

Proposed Plan For New Court

It would seem feasible to set up in our Anti-Trust enforcement procedure some kind of machinery that would carry out in a more effective manner the experiment of the last four years.

With this in mind the following suggestion is made:

Leave undisturbed the Federal Trade Commission in the function it now has, but in addition—

1. That an Industrial Court should be established.
2. That for the purposes indicated this court should have jurisdiction of all interstate trade and commerce excepting public utilities.
3. That parties entering into a contract or combination should have the right to submit their plan to the court for determination as to whether the proposed action would be a violation of the Anti-Trust Act. Upon the approval by this court any acts done in accordance with that approval should the deemed lawful. Provided, however, that should the subsequent acts of the parties go beyond, or be other or different from the matter contained in such petition, or plan submitted and approved by such court, such approval so given shall in no way operate to give effect to or immunity from prosecution for such acts as so executed, or any part thereof.
4. That such appproval should be final unless within a designated time the Attorney General should request a rehearing.
5. That likewise the Attorney General should have the right to submit to the court any proposal concerning which he was doubtful.
6. That upon the dissolution of a corporation by decree of a court, that the plan of reorganization be

assigned to the Industrial Court for the evolving of a plan of construction and reorganization.

Objection must be made to the establishment of this court upon the ground that such a court could have no jurisdiction of any proceeding which is not a case or controversy within the meaning of section three, Article two, of the Constitution, and that the proposals to be submitted to the Industrial Court would not constitute cases or controversies in the sense of that section, but would be merely an advisory proceeding in aid of executive action. An answer to this contention will be found in the case of *Ex Parte Bakelite,* recently decided in the October Term of the Supreme Court in 1928. That case involved the question whether Congress might authorize the Court of Customs Appeals to pass upon questions of law involved in a finding of the Tariff Commission which it proposed to report to the President. It appeared that the President might refuse to take affirmative action in accordance with a finding by the Commission approved by the Court of Customs Appeals. It was contended that as the decision of the court might be without affirmative force, the question could not properly be submitted to the court. The Supreme Court, in deciding that the Court of Appeals is a legislative and not a constitutional court, said:

> Legislative courts also may be created as special tribunals to examine and determine various matters, arising between the government and others, which from their nature do not require judicial determination and yet are susceptible of it. The mode of determining matters of this class is completely within congressional control. Congress may reserve to itself the power to decide, may delegate that power to executive officials, or may commit it to judicial tribunals. Conspicuous among such matters are claims against the United States. These may arise in many ways and may be for money, lands or other things. They all admit of legislative or executive determination, and yet from their nature are susceptible of determination by the courts; but no court can have cognizance of them except as Congress makes specific provision therefor . . . While what has been said of the creation and special function of the court (of claims) definitely reflects its status as a legislative court, there is propriety in mentioning the fact that Congress, always has treated it as having that status. From the outset Congress has required it to give merely advisory decisions on many matters. Under the act creating it all of its decisions were to be of that nature. Afterwards some were to have effect as binding judgments, but others were still to be merely advisory. This is true at the present time. *A duty to give decisions which are advisory only, and so without force as judicial judgments, may be laid on a legislative court, but not on a constitutional court established under Article III.*

In this paper there has been no purpose to suggest amendments to the Clayton Act. Nor has there been an attempt to propose revision of the Federal Trade Commission Act.

Revision Apart from Industrial Court

Experience under the working of both of these acts has demonstrated that there should be some revision, but such revision is apart from the principle embodied in the idea of the Industrial Court.

There has been no effort here to work out in detail the procedure or limitation or jurisdiction of that court. Undoubtedly it would be advisable if its action could be final, with the reservation of certain doubtful questions of law to the Supreme Court. But whether final or not it could serve a real purpose as an intermediate place before the Government would be committed to proceeding under the Sherman Act. In no way would it emasculate the Sherman Law and yet it would provide a test which the honest business man could regard with confidence when he had in view the acquiring of the property of a competitor. This court would constitute a tribunal where in a concrete case definite application of the rule of public policy could be applied. The confusion which now exists in the minds of cautious business men and which may often result in preventing constructive benefit to the public would be avoided. At the same time this court could be used as an immediate deterrent to those who would attempt to exploit the public by evasion of the law.

The problems presented in our present industrial age call for some such method. Legislative investigation for the past fifteen years indicates its necessity. Experience in the enforcement of the law has demonstrated its advisability.

Experiments in other countries have indicated that repressive measures alone are not sufficient. Wisdom dictates that before we are driven to broader governmental control or participation, it is desirable that by furnishing guidance and advice the initiative and resourcefulness of our industrial life shall be preserved.

German Calcium Acetate Imports and Production Decreasing

German wood distillation industry produced in 1913 about 18,000 tons of acetate of lime and processed another 20,000 tons imported almost exclusively from the United States. Comparable figures now are around 10,000 tons local production and 5,000 tons imported from Rumania and Czechoslovakia, the United States no longer figuring in this market. Official import figures of acetate of lime are the following:

Year	*Total Metric tons*	*Rumania Metric tons*	*Czechoslovakia Metric tons*
1925	2,841	2,001	729
1926	3,268	1,651	822
1927	5,906	3,164	2,440
1928	5,069	1,600	3,384

With German production of acetate of lime reduced, due chiefly to the high prices of wood for distillation, the sales possibilities of wood charcoal have also declined measurably as a result of the increasing use of gasoline soldering lamps, electric and gas flat irons. Declining sales of wood charcoal by Germany result in the reduction of sales of acetate of lime.

In the dry distillation of 100 kilos of acetate of lime, 30 kilos of acetone are theoretically produced, but in fact only about 25 kilos of ketones result, from which about 20 to 21 kilos pure acetone can be recovered. This lower yield may be explained by the fact that commercial acetate of lime possesses as impurities calcium salts of formic acid, propionic acid, butyric acid, etc., whose decomposition results in the formation of different ketones and other organic substances. Synthetic production of acetic acid and acetone from calcium carbide reduces the production of these products from acetate of lime, of which, as noted above, Germany consumed around 38,000 tons before the war.

Forty Years of Selling

OXALIC ACID

By Joseph Turner
Joseph Turner & Co.

LOOKING back forty years or more in the oxalic acid market, we find that at that time all of the oxalic acid used in this country was imported from England and Germany. The three English makers whose goods found their way into this country were Sadler & Co., Berk & Co., and J. D. Pritchard; while the two German brands which were imported in quantity were products of Koepp and Kuhnheim. Gradually the Germans secured control of this market and forced the English brands completely out of the picture. The first to go was Sadler, and Berk followed soon after, but the tough little Welshman, Pritchard hung on for a good many years, finally being forced out of the market about 1908 or 1909, after a brave but losing fight.

All oxalic acid was manufactured by the sawdust process in those days, which process was later superseded by the formate process in use to-day. In the early days oxalic acid tested from 95 per cent to 98 per cent pure, while to-day improved methods of production enable manufacturers to give a minimum guarantee of 99½ per cent purity. In those days the "tricks of the trade" were more numerous and considerably less ethical than they are to-day. I remember one day standing upon the store floor of a prominent chemical dealer in New York. We were chatting together when a truck drove up with a load of Pritchard oxalic acid, packed in casks of about 700 pounds net each. At another door of the store a truck was delivering epsom salts in light barrels of about 200 pounds each. With both casks and barrels rolling into the store at the same time, I was fearful that one of the barrels might be smashed by the heavier casks. This finally happened when a cask and barrel met in mid-career, smashing one and damaging the other so that the oxalic acid and epsom salts were spilled together on the floor. I turned to the dealer with a word of sympathy for the mishap, but his reply was, "Don't worry about it. They only got it mixed up a little quicker than normally."

Making 600 Tons Out of 500

The mixing of oxalic acid and epsom salts was a favorite trick in some quarters, and this same dealer took a 600 tons per year contract away from me by quoting a certain print works a lower price than I had already quoted him and them, and then later buying from me 500 tons to fill his order. He used the epsom salts method for increasing production. To-day, of course, the adulteration of oxalic acid could not be done on any but a very small scale as all the larger consumers work under chemical control. In days gone by, rule of thumb methods were almost entirely in vogue.

Many old-timers in the chemical business will also remember the occasion some twenty-five years ago when it was thought that a new use had been discovered for oxalic. The theory was that if furnace ashes were wet down with a solution of oxalic acid, they would burn again just as well as had the original coal. Until the falsity of this claim had been ascertained several hundred tons had been bought in small lots from local drug stores. This resulted in heavy orders from wholesale druggists and caused an advance in price from the 5 cents a pound which normally prevailed to 18 cents and 20 cents a pound.

Seventy Cents Oxalic

This was the highest pre-war price level of oxalic acid. During the war it sold as high as 65 and 70 cents per pound. This was followed by reductions, until in 1923 it was selling at 9 cents per pound. In the next two years, the price increased gradually to about 11 cents per pound which is the present minimum prevailing price.

Of a number of manufacturers of oxalic acid in this country who have at various times produced either commercially or experimentally, only two of those engaged in business prior to 1927 continue to manufacture this product. They are the Victor Chemical Works with its plant at Chicago Heights, Ill., and the Oldbury Electro-Chemical Co. of Niagara Falls, N. Y.

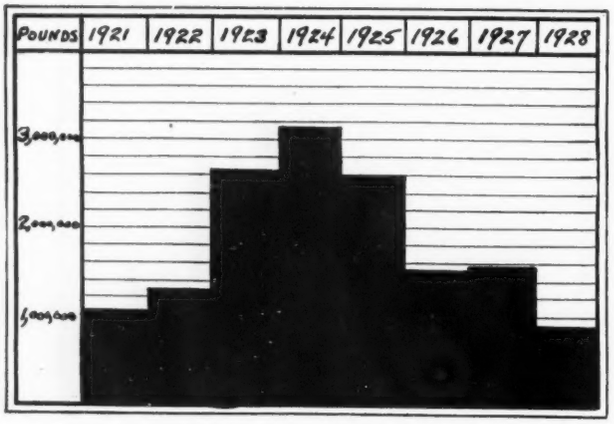
One additional manufacturer attempted the manufacture of oxalic acid in New Jersey in 1927, with results yet to be seen.

Early Attempts to Make Oxalic

Some years before the war attempts were made to manufacture oxalic acid from sawdust in the Maine woods. This, however, was not financially successful and the process was taken over by Louis Emory of Bradford, Pa., who for several years manufactured quite a large volume of oxalic at Bradford using the old sawdust process. His organization was called the American Alakli and Acid Co., and it was first forced to close by German competition in 1908. Subsequently the company was reorganized and during the war the plant was again in operation. But with the drop in prices after the war, it was again forced out of business in 1923, and the plant completely dismantled. Emory's financial loss on the venture was reported as being very large.

The first production of oxalic acid by the formate process was by the Victor Chemical Works in 1917. The Oldbury Electro-Chemical Co. began production in 1919. Others who began the manufacture of oxalic acid at one time or another after the war were the North American Co. of Wisconsin, the Essex Co. of Lawrence, Mass., the Semet Solvay Co. of Syracuse, N. Y., and the United Industrial Co. of New York. But by 1924 only Oldbury and Victor continued its manufacture.

Imports have steadily fallen off from 3,155,591 pounds in 1924 to 890,203 pounds in 1928 and to 332,



As indicated by this chart, imports of oxalic acid have decreased almost steadily since 1924.

535 pounds for the first six months of this year. It is quite probable that another two or three years will see them entirely eliminated. American consumption amounts to approximately 8,000,000 pounds per year and the productive capacity of American manufacturers of this material is quite sufficient to take care of all demands.

Increasing Uses of Oxalic Acid

To-day the uses of oxalic acid are much more varied than they were in the past. In the old days the laundry was the largest consumer, while to-day it cuts but a small figure. Oxalic acid is now used in a variety of processes such as the bleaching of wood, cotton linters, cork, straw and many other substances, in the dyeing of textiles, in tanning and leather stuffing compounds, in the de-inking of paper, as a souring agent in laundries as a reagent in various chemical processes, and as a raw material in the production of oxalates. It has, therefore, very wide and diversified application in many industries, although textiles, dye-stuffs and leather take the bulk of the product. A new development of the present year, which has thus far taken but a few hundred tons of this material, is its use in washing storage anthracite coal. Although small at present this may be quite a future outlet for oxalic acid.

The Industry's Bookshelf

Rayon and other Synthetic Fibres, by W. D. Darby, 65 pages Textile Publishing Co., New York, $1.50 net.

The textile editor of the "Dry Goods Economist" gives a brief account of the origin, development, use and manufacture of rayon, together with chapters on the merchandising and care of rayon fabrics.

Men and Machines, by Stuart Chase, 354 pages, The MacMillan Co., New York, $2.50 net.

Co-author of "Your Money's Worth" and author of the "Tragedy of Waste," embarks on an "unofficial survey to find out what machines have done to us, are doing to us, and propose to do to us in the immediate future."

The Problem of Industrial Relations and other Lectures, by Henry Clay, 322 pages, The MacMillan Co., New York, $4.50 net.

An indirect analysis of the problem of industrial relations by an examination of certain factors in industry and in the distribution of wealth, by which that problem is conditioned.

Brief Course in Chemistry by Lyman C. Newell, 412 pages D. C. Heath & Co., New York, $1.48 net.

A textbook for a brief course in chemistry with the subject matter limited to the topics for a minimum course in chemistry selected by a committee of the American Chemical Society.

Mergers in Industry, 205 pages, National Industrial Con, ference Board, New York $3.00 net.

A timely research into a few of the more specific and important questions which have been raised by the merger type of modern business organization.

Commodity Exchanges, by Julius Baer and George P. Woodruff, 319 pages, Harper & Bros., New York, $5.00 net.

Presenting a comprehensive picture of commodity exchanges, their organization, their purposes and their economic functions.

The Useful Art of Economics, by George Soule, 250 pages, The MacMillan Co., New York, $2.00 net.

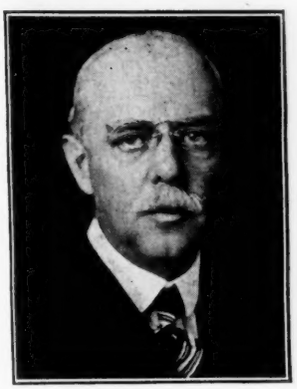
A study of the contributions to and by economics which might be missed by the non-professional reader.

Inorganic Chemistry for Colleges by William Foster, 837 pages, D .Van Nostrand Co., New York, $3.90 net.

A textbook designed for those who have had a good course in general chemistry and some work in qualitative analysis.

How Scientific Research Contributes *to the* WELFARE *of* LABOR

By Arthur D. Little
President, Arthur D. Little, Inc.



Perhaps in no other single place have the contributions of scientific research to improving the condition of the worker and promoting the general welfare been pointed out in such convincing fashion as in this article, abstracted from the president's address on "Science and Labor," delivered before the annual meeting of the Society of Chemical Industry.

WE ARE living in the age of science, the machine, and mass production. Like all the ages which have gone before, it is not without its contemporary critics. They would have us believe that science threatens to cause the destruction of our civilization; that the worker has become the slave of the machine; and that mass production has engulfed us in materialism, converted the craftsman into the tightener of a single bolt, and robbed the world of beauty.

All this, if true, would be, indeed, a sorry outcome of the long series of intellectual triumphs which, during the last one hundred and fifty years, have given man so large a measure of mastery over his environment. That such ideas find currency, among many thoughtful and sincere persons is in itself a challenge to us concerned specifically with the application to industry of one great branch of science. Let us, therefore, consider together what, if any, justification there may be for the indictment.

On the whole humanity seems to be improving. Meanwhile science is advancing at a rate so rapid that the peoples of the earth who might otherwise indulge their collective passions will presently decline to engage in a business so vastly expensive and mutually calamitous. If philosophy and religion cannot bring peace to the world, our hope for peace is in more science.

The machine as it exists to-day, in all its complex manifestations, is the undoubted product of science, and for its reaction upon our civilization science must assume a large measure of responsibility. Moreover, without the machine mass production would be impossible. What, then, is, now, the actual relation of the worker to the machine, and what is the relation of the machine itself to society at large?

Through research we come to automatic machinery and better manufacturing methods. These result in lower costs. Lower costs permit higher wages and lower prices, both of which stimulate consumption. To meet the new demand the scale of production rises, permitting new economies, which further lower costs. To maintain mass production there must be mass buying, and mass buying is possible only with high wages.

In April, 1926, the General Electric Company issued to its stockholders a circular to tell them what their company was accomplishing in its Schenectady plant by the introduction of more automatic machinery and improved methods. In 1914 the number of workers employed was about 15,600. In 1925 it was 21,000. Their average income in dollars actually paid per week increased during this period 107 per cent, while the cost of living went up only 68 per cent. Similarly, the money value of the annual product of the plant increased 179 per cent, and although the average of commodity prices had increased 62 per cent, the average price of all General Electric products had risen only 16 per cent, and in the case of some things, such as incandescence lamps, was actually lower than in 1914.

There have been long periods in the world's history when otherwise brilliant civilizations based on slavery flourished and when the world's work was done by slaves. Their monuments remain in the pyramids of Egypt and the ruins of Greece and Rome. In Italy during the time of Claudius the proportion of slaves to freemen is given by Blair as three to one, whilst in Greece, during her greatest period, there are said to have been 12,000,000 slaves to 5,000,000 freemen. Slowly, and with many recessions through the centuries, the machine, together with

some education of the heart, has brought emancipation to the worker.

But the machine has brought mass production and the man who spends his working hours tightening a single bolt. I have watched him at work as the Ford automobile was assembled in twenty minutes, and he seemed to like the job. He wasn't merely tightening bolts; he was building automobiles, and they left the assembly line at the rate of four a minute. He had steady work, good pay, and his hours were not long. On the whole, he would prefer it to the effort and monotony of turning a windlass to hoist ore as other men once did.

It is true, nevertheless, that there are many jobs at machine tending, where the worker has no responsibility for its control, which are demoralizing and deadening for the individual endowed with imagination and initiative. Not all workers, however, are so endowed. There are those who prefer repetitive work which they can easily learn, and which makes little or no demand on mentality.

Importance of Adjustment to Job

The importance and advantage of the proper mental and physical adjustment of the worker to his job are beginning to be recognized by science and management alike. His reactions under strain and the many factors affecting his well-being and efficiency are now the subjects of serious study by such agencies as the Industrial Fatigue Research Board and the National Institute of Industrial Psychology in England, the Psychological Institute of Paris, and other organizations and individuals in the United States. There especial significance is attached to the comprehensive program of research recently undertaken by the School of Business Administration of Harvard University in conjunction with the Harvard Medical School.

For this research there has been organized a group of eminent physiologists, psychologists, medical specialists, and biochemists, who are endeavouring to investigate the human individual rather than a particular physiological mechanism. To this end they are proceeding to take as many as possible of the various measurements simultaneously, and they are thus beginning to arrive at some general understanding of the way in which the various organic functions supplement and compensate each other. Through this simultaneous study of the various organic changes which result from effort the laboratory has reached an important initial generalization, which is that "high production occurs if the worker's organism is kept at equilibrium when his metabolic rate (his consumption of oxygen) is lifted." This gives a new conception of "work" and provides a first tentative indication of the way in which the happiness and content of mental equilibrium may be related to organic equilibrium or changes of organic balance.

Concurrently with the studies in the laboratory investigations are going on into the preoccupations of the worker as developed not only by his job, but by his family and social environment.

We may reasonably expect that science, through its studies of the worker himself in all these aspects, will ultimately show the way to such better adjustment of the worker to the work as shall add greatly to his contentment and well-being.

Science Creates Jobs

For many years manual workers entertained the fallacy that there is only so much work to be done in the world. Since its amount seemed to them hardly sufficient to keep them all employed, it appeared obvious that any device that enabled one man to do the work of two must deprive the second man of his job.

This idea was, of course, the actuating thought behind the riots which destroyed Whitney's cotton gin in America, and it was similarly responsible for much of the disturbance which attended the Industrial Revolution in England. That it even now persists in some quarters is shown by the restrictions still placed on production.

The typewriter undoubtedly displaced some copying clerks, but it provided employment for a far greater number of typists, led to the establishment of special schools, and provided jobs for thousands in factories for manufacturing the machines and their accessories of ribbons, carbon paper, stencils, and so on.

The linotype, which enabled one man to do the work of six, reduced the hours of work from 10 to 8, and put wages up 20 per cent. It improved shop conditions and ensured greater regularity of employment. It eliminated the tramp printer, but ultimately provided more jobs and better jobs for workmen of a higher type.

The introduction of pneumatic tools like the riveter, drill, and stone chisel undoubtedly for a time deprived some men of work, but they so facilitated metal and stone work, the sinking of foundations, and the fabrication of steel structures that, in America at least, the volume of such work increased so rapidly that many more men soon found employment in the operation of these machines, while the making of the machines themselves became an important industry.

In spite of the ultimate benefits to labor accruing from the machine, the introduction into a standardized industry like bottle-making of a machine which enables one man to do the work of 41 must result in serious temporary disarrangement and create an acute displacement problem.

Knowledge is of two kinds, static and kinetic. Static knowledge may satisfy the individual, but only as knowledge becomes kinetic can the world's work be done. It becomes kinetic as it remoulds men's minds or induces thought which leads to action, and it then finds perhaps its commonest expression in invention.

Fortunately a large proportion of the new knowledge acquired by the world through the incessant questioning of nature during the last hundred and fifty years has assumed the kinetic form, with the result that science has not only freed the mind of man from countless inhibitions and taboos, but has become the most prolific creator of new jobs.

In considering the impact of science upon industry one's thoughts naturally first turn to electricity. We are within two years of the centenary of those pregnant discoveries of Faraday in the laboratory of the Royal Institution, which, for the first time, made possible the production of current by mechanical rotation. The earlier contributions of Volta, valuable and suggestive as they were, left us with no better source of current than the primary battery. Before Faraday there was nothing upon which to build even the beginning of an industry. Faraday furnished the fructifying idea which in the minds of Wheatstone, the Siemens, Gramme, and Pacinotti soon bore fruit as the dynamo. Upon this machine as its foundation has since been built the great superstructure of the electrical industry with its electric light, power, and traction companies, electrochemical plants, and the manufacturing companies which furnish a bewildering variety of electrical equipment, apparatus, and supplies.

Contributions of Electricity

Electricity is now a servant in 16,000,000 American homes, in many of which it condescends to wash and iron clothes, clean the carpets, cook, and fill the ice chest. It is rapidly reaching out to the rural districts to lighten the labor of the farmer and his wife. In 1869 the power at the command of an American workman was $^{6}/_{10}$ horse-power. To-day it is 4¼ horsepower, the equivalent of 55 man power, and three-fourths of this is furnished by electricity. In the absence of statistics I can only hope that your imagination may enable you to form some adequate conception of the multitudinous opportunities for employment which these developments have brought to labour. As a starting point there is the fact that 300,000 men and women are employed in the 1,700 establishments engaged in making electrical equipment. This has an annual value of 1½ billion dollars, and includes 500 million incandescence lamps.

The telephone is another child of science, and since its birth it has been continuously nourished on research, for which it has developed an amazing appetite. To-day in the laboratories of Western Electric Company over 3,900 people, more than half of whom are scientists and technicians, are engaged in telephone research, as distinguished from development. It pays, or it would not continue to be supported by appropriations of more than $13,000,000 annually.

Approximately 400,000 persons are directly engaged in the operation of telephone systems in the United States, and of these about 250,000 are women.

About 75,000 more, of whom some 17,000 are women, are directly employed in the manufacture of telephone apparatus. To these must be added 7,500 to 15,000 others whose work is the extraction or fabrication of materials used in telephones and auxiliary equipment. To science, as embodied in the telephone, labor is consequently indebted for something like 500,000 new jobs.

Labor has been called upon, in the United States alone, to install more than 700 broadcasting stations and to manufacture over 7,000,000 radio sets, while in six years the radio industry has evolved into one of our leading industries with an annual turnover exceeding $600,000,000.

There are in the United States approximately 235,000 employees in the motion-picture industry. Of these, 75,000 are in production, 20,000 in distribution, 110,000 in theatres, and 30,000 in other branches. In Hollywood there were given to extras, in 1927, 330,397 jobs, each representing one day's work at an average pay of $8.59.

Every day 25,000 miles of film are handled by the exchanges. The production of the film base and its sensitive emulsion is an industry in itself. Still other industries profit largely and other workers find employment in providing the great quantities of lumber, the many costumes, the volume of printed matter, and the numberless accessories required by producers.

Effects of the Automobile

It is probably well within the truth to say that, in America at least, no development of applied science has had so varied and powerful a reaction upon the economic and social structure as the automobile.

The automobile itself takes 14 per cent of the steel output of the country; it has stimulated the oil industry to greatly increased use of steel, and is directly responsible for the consumption of much more still in building and construction. It uses more than half of all the plate glass we produce, and innumerable other industries profit by its demands upon their product. In five years from January 1, 1920, tractors, auto trucks, and stationary gas engines brought such decline in the number of horses and mules on United States farms as released 15 to 20 million acres for uses other than forage.

The automobile has provided jobs for more men than were in the United States Army in the World War, though they numbered over four million. As evidence let me cite the impressive figures given me by F. O. Clements, the technical director of the research laboratories of General Motors Corporation.

The automobile industry in the United States employs directly: Motor vehicle factory workers, 324,665; parts and accessory factory workers, 300,000; tire factory workers, 95,000; motor vehicle dealers and salesmen, 363,000; supplies, accessories, tires and parts dealers and salesmen, 160,000; garage employees

125,000; repair shop employees, 300,000; professional chauffeurs, 600,000; professional truck drivers, 1,300,000; gasoline refinery and oil workers, 105,000; automobile financing and insurance, 20,000; total directly employed, 3,692,665.

Mr. Clement's total for those indirectly employed is 371,000. He thus credits to the automobile employment for a grand total of 4,063,665 persons. He has still to include the great but undetermined number of real estate operators, builders of garages, salesrooms, and office buildings, paper makers, advertisement writers, printers, and many others to whom the automobile furnishes means of livelihood. Measured by the wholesale value of its product, the automobile industry is now the greatest in the country with the single exception of agriculture.

Science has recently enabled man to achieve a three-dimensional existence, and is bringing new opportunities to labor at a rate the acceleration of which none can foresee. Though the United States has moved more slowly in aircraft production than some other nations, it employs in the industry to-day about 75,000 workers against only 5,000 seven years ago.

I can form no estimate of the number employed in making rayon by Courtauld's in England, or in the production here of Celanese, but in the United States the rayon industry already gives employment to about 50,000 operatives.

In 1863 Wöhler prepared calcium carbide for the first time in small quantity and as an amorphous powder. The compound had no industrial significance, however, until 1893, when Willson, in North Carolina, produced it in massive crystalline form by heating lime and tar in an electric furnace. On coming in contact with water it evolved acetylene. Starting with these discoveries there has gradually developed the great structure of Union Carbide and Carbon Corporation, which, through its subsidiaries, employs 25,000 men.

Another great industrial organization, that of E. I. du Pont de Nemours & Co., Inc., is similarly deeply rooted in chemistry and carries on its pay roll 33,000 employees. The annual report of Imperial Chemical Industries, Ltd., for 1928 records the fact that this great corporation now employs 53,000 persons.

This brief survey will have failed altogether of its purpose if it has not brought home the fact that with the world's growing population the only remedy for unemployment is research. Were it not for the millions of opportunities afforded workers in the enterprises based on the contributions of science in years within the memory of most of us, we should now be faced in the United States with an unemployment problem appalling in its magnitude and heartrending in its results.

Editor's Correspondence

Editor, CHEMICAL MARKETS;

About a fortnight ago I saw a report in the London "Evening News" with regard to deaths in Chicago due to the inhaling of refrigerant fumes. I at once obtained some editions of the "Chicago Tribune", and the following observations are a result of my perusal of the various publications.

Any gas inhaled is fatal, even oxygen. Poisons depend upon the quantity taken, that is, they are a matter of dosage. Refrigerant fumes being heavier than air would lie near the floor. Draught from open windows etc. would blow them in one direction.

The American paper states that a sizzling noise was heard by a person entering the apartment in which the leakage occurred. For escaping fumes to cause a sizzling noise, there must have been a very large leakage. The building was of five stories containing seventy apartments, all supplied with cold from a multiple system in the basement. It is stated that a large amount of gas in the multiple system leaked into the small apartment. It is, therefore, likely that this one apartment had its own quantity of gas and some of that belonging to the sixty-nine other apartments. During the evening the family felt ill and retired to bed and were found late the following day dead. This shows a constant increase in the volume of gas.

Had the refrigerating plant been of small size, sufficient to supply the apartment alone with cold, death could not have occurred. The installation was of the same make as another one where a death also took place.

It has been suggested that a distinctive odour or irritant should be imparted to the refrigerant. The mixing of a refrigerant with other products would not render it inocuous. To a person awake it might give warning but to anyone asleep or without a sense of smell, it would be useless. The refrigerant and its fumes should be secured in a strongly constituted machine without movable joints. It should be remembered that all refrigerants are poisonous, as is everything except the air we breathe.

Leakage from a refrigerating machine is akin to leakage of coal gas supplied in geysers and cooking stoves. Either the installations are faulty or perhaps of such a flimsy nature that an actual breaking of a small part or the puncturing of a pipe with a sharp instrument in order to obtain ice which collects, may have been the cause.

It is risking too much to instal seventy or more branches of refrigerating cabinets from one main large source, when one small plant, if faulty, could receive the whole contents of the large installation. Separate installations are easily worked with between two and five pounds of gas, the escaping vapour from which would not be sufficient to cause death, and which, owing to its heavy nature would remain close to the floor. Chicago is lucky that its 150,000 installations mentioned are not all supplied from one source.

All devices have a beginning, and as it is stated that over two million refrigerators have been installed in the country, the Chicago total of seven deaths attributed to refrigerating gases cannot be considered a high one. The deaths from geysers and cooking stove fumes, not to mention petrol fumes, show a much higher percentage than the foregoing. In this country, the use of motor vehicles causes as many deaths and non-fatal accidents as would occur in a small war, but no one would compel the withdrawal of coal gas or petrol because of the blunders of individuals and faulty installations of flimsy or defective construction.

I have had for twenty-five years the sole experience in this country of the manufacture of hundreds of tons of these refrigerant hydrocarbons. Not a single accident has occurred.

The whole of the Chicago happening comes down to this: Modern inventions and the products arising from them are excellent servants but bad masters.

(Signed) ALBERT HENNING,
Chairman & Managing Director,
HEDLEY & CO. (LEYTONSTONE) LTD.

Preventing Failures and Speeding Progress through

ECONOMIC RESEARCH

By Robert H. Dick
President, Barrington Associates, Inc.

IF we realize that the single most potent factor in business to-day is management, the importance of economic research is brought home.

Time was when the soundness of a business enterprise was judged almost solely by its audit and appraisal, but now another factor is inquired into by the banker and the wise investor. That factor is the capacity of the management.

The extent and complexity of modern business, the rapidity with which technical research is giving us new and often economically revolutionary products, and the keen competition of a buyer's market, make management a much more important factor in business enterprises than it ever has been before. "Scientific administration demands as the head of an enterprise, an intelligent active executive who appreciates the value of commercial and industrial research," says Fred W. Shibley in his book "The New Way To Net Profits."

Economic research is the application of scientific laws and principles to the solution of economic problems.

It may be divided into pure and applied, the distinction being largely one of intention and of the nature and scope of the problem. Pure economic research is that pursued largely for scientific and altruistic ends, and upon economic problems of general interest. Work of economists like Mitchell on business cycles and of Mills on commodity prices are good examples of pure economic research. Much of the research of the well known economists, and of others not so well known, is in this field. Also much of the economic research of our colleges and universities, of institutions like the National Bureau of Economic Research, and of the National Industrial Conference Board falls in this category. The worker in applied economic research draws heavily upon the product of the workers in pure economic research, not only for material but for methods and inspiration.

"Economic research is a systematic effort to profit by experience."

Applied economic research is research directed toward the solution of specific problems of business. It may be to the problems of a business or of a group of business concerns engaged in the same general line of endeavor. In any case its purpose is to increase or to safeguard business profits.

What are some of the things that applied economic research can do for a business? We list a few. Any active executive can name a dozen economic problems, peculiar to his business, that should be solved.

(1) Detect trends in the affairs of a business and look behind the balance sheets to discover the reasons for them and their probable ultimate effect upon the company's welfare.

This is an activity of especial interest to financial institutions, as well as to the management itself, for the day is passing when a bank, trust company or investment banking house is satisfied to judge the soundness of an industrial enterprise solely by its present condition. The present tendencies in the financing of industrial companies is making it more and more necessary that the investor assure himself of the continuing soundness of the enterprise in whose securities he places his funds.

This, of course, does not mean that the audit and appraisal are not to be used to determine a company's financial position and its physical assets, but these do not go far enough. It is equally important to determine the true economic position of the company, its products and that of the industry.

(2) Appraise the intangible assets which every going concern possesses.

The "intangibles" frequently are more important than the tangible assets of a company. What is the value of a trademark, of a trade name, of a going sales organization

or of a technical research department. What is the value of "Solvay" to the Allied Chemical & Dye Corp. or of "R. & H." to Roessler & Hasslacher? How much would it cost to build up such an organization as that of the Grasselli Chemical Co. or the International Agricultural Corp?

(3) *Measure the favor with which a company's products are received by consumers.*

This favor is a most important asset of an enterprise. How do sales compare with those of competitors? Are they declining while those of competitors climb? Is some competing product taking your share of the consumer's dollar as rayon has invaded the domain of silk; as the use of liquid chlorine has supplanted bleaching powder; or as manufactured nitrates are cutting into the market for natural nitrates? If so, why and what is to be done about it?

(4) *Estimate the probable future demands for a company's products.*

Is demand likely to increase or decrease? Suppose, for instance, a manufacturer of vat dyes were to ask this question. What are some of the things research would examine into? First, naturally, the manufacturer's own records to discover trends in sales with respect to volume, time, territories, colors, kind of buyers and many other factors, would be examined. It would study the trends in, sales of fabrics, of threads, of notions, of patterns, of registration in courses in textile courses in high schools and colleges, of possible new materials, of the use of awnings, of the sales value of fast colors and of such other indicators as knowledge and ingenuity might suggest. Out of all of this study would evolve an answer.

Discover Trends in Consumer Demands

For example: Is the demand for rayon to continue to increase indefinitely at its present rate? Is the use of coal for domestic heating purposes to continue to decline before the onslaught of fuel oil?

(6) *Chart and analyze the trends in prices for a company's products and determine where they lead.*

(7) *Discover needs for new or better products or new applications for existing products through study of trends in economic demands.*

The growth of commercial aviation has been responsible for the development of many airport accessories. The trend toward mass production caused the development of better steels for cutting tools. The demand for foods packaged in small quantities, due to changes in methods of living and city housing conditions, has been one factor in suggesting a new use for automatic vending machines.

(8) *Estimate the probable reception of new products through study of trends in present consumer demand and through estimation of the volume of potential markets.*

Is the buying public receptive to goods similar in nature? A new lacquer solvent or a new rubber accelerator is accorded a better reception than a new acid, a new automobile accessory than a new buggy whip, to cite extreme examples. Is the market to be entered large or thin, and what are the possibilities for future development?

(9) *Study trends in science and invention as indicators of the advent of new products, and processes which may seriously jeopardize the demand for a company's present products or make its manufacturing processes obsolete.*

This is a joint function of economic and technical research. Many instances of markets dwindling because of new inventions could be cited. Quinine for colds displaced by aspirin, kerosene and gas lights by incandescent lamps, vanilla by vanilin, batteries by vacuum tube rectifiers, hard rubber by various chemical plastics and vegetable dyes by aniline dyes are a few of the most familiar.

Detecting Population Shifts

(10) *Detect population shifts, and determine their probable effects upon consumer demand.*

The population of different districts of a city change due to migration of industries and citizens. These are predictable through study of trends shown by census figures and other data. As the character of population changes, the character of consumer demand changes also and the nature of this change can be forecast. So too, industries migrate and such research of more transcendent importance than to the chemical industry.

(11) *Estimate the saturation point of markets.*

Markets may become thin. There is a very definite limit to the rate of absorption of chemicals, or of the absolute quantity of these raw materials, that a market can take. There is a limt ito a concern's share of a market. What is that limit, has it been reached or how fast is it being approached? When it is reached, then what?

(12) *Study and estimate the probable effects of tariff legislation.*

Will the market for our products be affected, will the price, source or quality of our raw materials be influenced by such legislation? If so, how, to what extent and is there anything that should be done about it? Economic research can help find answers.

(13) *Determine when and how much to buy.*

Since buying is the reciprocal of selling, obviously the same general methods of economic research as are applied to the problems of selling can be applied to the problems of buying. Trends in prices, in available supplies, discoveries and inventions and the effects of tariff legislation are just as important considered from the buying as from the selling angle.

(14) *Determine the efficiency of management.*

There can be an aim or goal set for a company, as well as a quota for its sales force. The progress of the company toward that goal can be measured and the

degree of success in attaining it determines the efficiency of the management. The days are short when the Bourbon executive can retain his place through the process of "explaining" if he does not produce. In applied economic research business has a means of measuring managerial efficiency.

Economic research is a task for a specialist. Just to know what has already been done, where to find it recorded, and where to find the raw material necessary to the solution of specific problems is no considerable part of such a specialist's equipment. In addition he must be endowed with a keen desire to know how and why, be trained in the methods of research, and he must have a large stock of general information. He must be resourceful, possessed of a practical imagination and, above all, he must be conscientious and honest. Meticulous honesty is just as essential a qualification in a research man as in a bank employee, in fact, even more essential. There are checks and bounds surrounding a bank employee that cannot in the very nature of things be placed around a research man.

Methods of Economic Research

Space is not available to go into details as to methods of carrying on economic research. Naturally they differ from those of technical research, with which readers of CHEMICAL MARKETS are so familiar, in that they deal with economic instead of physical and chemical facts.

Furthermore, economic factors are often of a changing rather than a static nature. Only infrequently does economic research have available that tool, experiment, which is such an important part of technical research. Some experimental work is carried on in market research to test consumers' acceptance and we believe that more of such work will be done as the science of economic research develops.

We have touched briefly on how and by whom research in pure economics is conducted. Applied economic research may be carried on by business concerns in one or more of three principal ways—

(*1*) *By research workers permanently employed by the company.*

This is the method used by the larger corporations. The work done is called by a variety of names, such as statistics, sales research, market analysis and commercial research; but it is essentially economic research. Such workers should be under the direct supervision of a company officer, the higher in authority the better. They should not be required to do work incident to any other department. Neither should they be forced to work under pressure for research of any kind cannot be carried on under such conditions. Furthermore, they should be encouraged to cultivate a detached mental attitude so as to view company problems as an unbiased outsider would look at them. A great advantage of this method of conducting research is that it is continuous.

(*2*) *By co-operation with other concerns in the same branch of industry.*

Trade associations and institutes are examples of organizations which can, and often do, engage in economic research. Such organizations naturally must limit their research activities to those economic problems of the industry which they can study, other things being equal, to better advantage than any individual concern could. General trends of the industry, problems incident to competition with other industries, effects of tariff legislation, over-production, price trends, favor with which the industry's products are received, probable future demands and market saturation points are some of the economic problems that can be attacked by group action. The chlorine and industrial alcohol industries are conspicuous examples of industries with economic problems responding to co-operative research. Much good has been done by numerous associations for their respective industries.

(*3*) *By employment of outside consultants specializing in economic research and operating on a professional basis.*

This method is used by large and small concerns alike. It makes available to the small concern highly trained specialists, of wide experience, capable of rendering a grade of service that only the very largest corporations could employ on a permanent basis. Obviously research carried on solely by this method is not continuous. A distinct advantage of this method is the fact that it brings an unbiased outside viewpoint.

All three methods have their peculiar advantages and each company must decide which one or what combination of them best meets its needs. The second is seldom sufficient by itself, but should be supplemented by either or both of the first and third.

What Economic Research Is Not

It might now be well to speak briefly of some misconceptions. Research is not a panacea for business ills. Rather, if the health metaphor is to be pursued, it should be regarded as a preventive. But it is more properly called a business tool intended for a special purpose and employed to best advantage by a worker trained to use it. The results obtained, like the results from the employment of any other tool, depend largely upon the skill with which the tool is used.

Applied business economic research is not a means of proving an idea or a theory. Such use of it has been aptly characterized "misapplied research." The true research worker would make a poor advocate. He insists upon seeing all sides of a question. He is not satisfied with less than all of the facts that his knowledge and skill enable him to find. He prides himself that he does not allow anything but facts to influence

him and that he draws conclusions as conscientiously as is humanly possible, regardless of the consequences to any one's pet ideas or theories. A theory may grow out of research but one should not be formulated in advance; otherwise the scope and thoroughness of the research is very likely to be affected adversely.

Learning By Experience

Wesley C. Mitchell in his review of the report of President's Hoover's Committee on Recent Economic Changes says—"Associated with the prudence which has tempered enterprise is a more systematic effort to learn from experience. Here there seems to be a new emphasis, if not a new practice. Most can be learned from experience, when it is exactly known, and seen in relation to its environment. The most exact records of economic experience are statistical in form. Since the war, an increasing number of officials, publicists and business men have fostered the keeping of better statistical records, and have analyzed past experience as a guide to future planning. Every reader must realize that, without the aid of the new statistics which this widespread effort has provided, the present survey of recent economic changes would be more imperfect than it is. What is of use in providing a factual basis for determining economic trends at large is not less useful in determining the factors which effect the success of private enterprises."

Though its actual application to business is far from simple and calls for specialization, economic research in essence is a systematic effort to profit by experience.

New South African sodium nitrate deposits, which occur in the Gibeon district, about 300 miles by railway from the coast at Angra Pequena, are reported to be very extensive. Several hundreds of samples have been analysed and these samples have been taken from points, in some cases more than 200 miles apart. Altogether, it is believed that the nitrate area covers well over 10,000 square miles, while the Government Proclamations made under the South African mining laws have claimed a total area of 32,000 square miles. The average analysis of the crude nitrate material, as given by Professor J. Smeath Thomas, is 16 per cent of sodium nitrate, 1.5 per cent pf potassium chloride, 5.5 per cent of sodium chloride, 5.3 per cent of sodium sulfate and 0.8 per cent of calcium bicarbonate, the remainder being insoluble residue such as clay, gravel and sand. In the caliche beds of Chile the average sodium nitrate content is 25 per cent, while there is also present about 3 per cent of potassium nitrate, which apparently does not occur at all in the South African deposits, nor is any mention made of the presence of iodine compounds in these latter.

German consumption of superphosphate fertilizer this year increased 30 per cent over its corresponding last year's level. Superphosphate shortage in fertilizing local soils has been one of the outstanding deficiencies in German post-war crop culture, and doubtless is one important reason for the lower crop yields compared with pre-war, despite the higher consumption of potash and nitrogen fertilizers, according to the Department of Commerce. Comparative figures of superphosphate consumption by Germany are 1913-14, 1,611,621 metric tons; 1923-24, 476,516 tons; 1927-28, 724,858 tons; 1928-29, 1,000,000 tons.

Who's Who In Chemical Industry

French, Albert, vice president, International Agricultural Corporation. Born, Jersey City Heights, N. J.; mar., Elizabeth Bassett Short, Montclair, N. J., 1889; children, 1 dau. Standard Oil Co., 1885-89; Liebig Mfg. Co., secy., treas. 1889-99; Amer. Agric. Chem. Co., vice pres., 1899-1910; Internatl. Agric. Corp., vice pres., 1910 to date. Hobby: foot fisherman. Address: International Agricultural Corp., 61 Broadway, New York City.

Herrly, Clarence John, superintendent and sales engineer, Niacet Chemical Corp. Born, Pittsburgh, Pa., 29 Jan. 1893; educat., Ph.C., Ch.E. Phenol and Salicylic Acid Plants, chem. engr., and supt. on constr., 1915-17; Union Carbide & Carbon Corp., develop, of chem. ind. from acetylene since 1917; develop of the synth. chem. indust. from calcium carbide and acety. in the U. S. Memb., Amer. Chem. Soc., Cham. Comm. (Niagara Falls), K. C., Phi Kappa, Phi Lambda Upsilon. Hobbies: music, golf. Address: Niacet Chemicals Corp., Pine Ave., and Union St., Niagara Falls, N. Y.

Metz, Herman A., president and director, General Dyestuff Corporation, H. A. Metz & Co., Inc., H. A. Metz Laboratories, Inc., Consolidated Color & Chemical Co., Central Dyestuff & Chemical Co., director, Grasselli Dyestuff Corporation. Born, New York City, 19 Oct. 1867; educat., Newark, N. J., high schl., Cooper Union, chem.; Union Coll., D.S.C., Manhattan Coll., LL.D. P. Schulze-Berge, office boy, 1881, later Schulze-Berge & Koechl, then Schulze-Berge, Koechle & Movious, then Victor Koechl & Co., then H. A. Metz & Co. and Farbwerke-Hoechst Co., then H. A. Metz & Co., Inc., 1917, and H. A. Metz Laboratories, Inc., 1917; organized General Dyestuff Corp. 1925, absorbing Dyestuff Dept. of H. A. Metz & Co., Grasselli Dyestuff Corp. and Kuttroff, Pickhardt & Co., dir. Director of: First Natl. Bk. Bklyn., Central Mercantile Bk. & Trust Co., N. Y., Internatl. Germanic Trust Co., N. Y., Interborough Rapid Transit Co., Subway Construction Co., and various other corporations; Bd. Educat., Bklyn. & N. Y.; N. Y. State Bd. Charities; Comptroller N. Y. C., 1906-10. Capt. & Lt. Col. 14th Inf. N.Y.N.G., Col. Ordnance & Q. M. Corps, 27th Div., N.Y. N.G., O.R.C., U. S. Army. Published Yearbook for Colorists and Dyers, 1905-17. Various patents in chem. and electrical and mechanical fields. Member all chem. organizations and many coml. and social clubs. Hobby: politics. Address: General Dyestuff Corp., 230 Fifth Ave., New York City.

Orr, Arthur, vice president, Commercial Solvents Corporation. Born, Evanston, Ill., 4 Oct. 1884; mar., Alice McK. Meigs, Keokuk, Ia., 9 July 1908; children, 2 sons, 2 daus.; educat., Seville, Vevey, Switz., Lawrenceville Schl., N. J., Princeton Univ., B.S., 1906; Ecole des Sciences Politiques, Paris, Frgn. Serv., 1908-17; U. S. Army 1917-19; Banking, Chicago, Ill., 1920-23; Comml. Solvents Corp., 1923 to date. Secy. Embassy, Berlin, London, Rio de Janeiro, Paris; Div. of Information—State Dept.; Capt. Air Serv., A. E. F. Clubs: Univ. (Chicago), Racquet (Chicago), Saddle and Cycle, Chicago Golf (Ill.), Metropolitan and Chevy Chase (Wash., D. C.), Princeton (N. Y.) Hobbies: golf, squash. Address: Commercial Solvents Corporation, Terre Haute, Indiana.

Quinn, M. M., secretary and general manager, Keystone Wood Chemical and Lumber Corp. Born, Susquehanna, Pa., 1888; mar., Gertrude Stewart, Bradford, Pa., 1916; children, 1 son; educat., Villanova Coll., A. B., 1910; A. M., 1912. Quinn Interests, genl. supt.; Smethport Wood Products Co., genl. supt.; Tionesta Valley Chem. Co., secy.; Olean Sales Corp., pres. Memb., K. of C. (Olean, N. Y.) Clubs: Hamilton, City. Hobby: golf. Address: Exchange Natl. Bank, Olean, N. Y.

Remedying the Ills of an Industry Through Uniform Cost Accounting

By William G. D. Orr

UNIFORM cost accounting is a great economic aid to any competitive industry. Those industries which have adopted a uniform system of cost accounting have reaped monetary benefits in the form of profit, without resorting to the extravagant practice of price fixing, because if several companies in the same line of endeavor find their costs in the same way and the figures so found are available to all—price fixing is not much of a temptation. Common business judgment designates what should be added for profit, with the result that, under such arrangements, selling prices in an industry so governed, reach a natural economic level.

So deep-rooted is the assumption within the chemical industry that cost accounting method is strictly the business of each organization individually, that it is quite refreshing to find Mr. Orr advocating uniform cost accounting practice and reinforcing his ideas with actual experiences of the brick industry in securing the adoption of such practice. He also makes a distinction between "cost finding" and "cost keeping" which is very much in point.

Conditions existing in the brick industry about fifteen years ago, previous to the adoption by that industry of uniform cost accounting practices, were typical of conditions exesting in most industries at that time and which even to-day still prevail in many. The experiences of that industry in establishing a uniform system of accounting might well serve as a valuable object lesson to those engaged in the manufacture and sale of chemicals, or in fact, to any other competitive industry.

At that time, there were about fifty companies which comprised the industry and each company had its own system of cost accounting. None was perfect; some were good; but most of them were little better than the system of the man who put the money he received into his safe, paid his bills out of it, and at the end of the year considered what he had left his profit. Under such chaotic conditions, the prices at which the products were sold were ridiculous in the extreme.

One outstanding example was that of a manufacturer who sold his product at a lower price than anyone else and paid dividends that were unwarranted because they were really not earned. He continued this practice for over three years, even borrowing money during the latter part of this period in order to pay the dividends. His statements on their face showed that he had earned these dividends due to the fact that his inventory was incorrectly priced, and when finally adjusted, it had to be reduced about 75 per cent, because the material could not even be sold for the price at which it was being carried. Selling it at a profit, at his inventory figure, was entirely out of the question.

Of every hundred brick that are manufactured, at least 25 per cent are off-grade and must be sold at what might be considered scrap or cull prices. Therefore, the 75 per cent. should bear the cost of the entire hundred and the 25 per cent. be considered as a by-product, and profit and loss credited with what ever the by-product brings into the treasury. The manufacturer in question, however, divided the total amount of money expended for labor and material by the number of brick manufactured, and assumed the result to be his cost. To that figure he added what he considered a reasonable profit and thus arrived at his selling price. As there was no market for the off-grade material, it was kept in storage and inventoried at the false cost. He thereby fooled himself and showed a satisfactory financial statement, but the business failed.

A number of men in charge of production in the various brick plants became dissatisfied with conditions existing within the industry and decided to form a trade association for the dissemination of mutually helpful and valuable information. That association had not been in existence for very long before all the members realized the necessity of taking some action to bring about a healthier condition in the industry. Inaccurate and unreliable costs were

determined to be the germs of the disease from which the industry was suffering.

A prominent firm of accountants was consulted and eventually employed to devise and set up a uniform system of accounting that would be applicable to the entire industry. A meeting of the industry was called and the report of the accountants presented. Out of some forty companies represented, only six agreed to put the system in force. Fortunately these six were among the larger companies and their officers persons of considerable influence. Their plan for persuading the other members of the industry to adopt the uniform cost system was a very simple one and it worked with startling rapidity and effectiveness.

Bankers in the communities supporting most of the companies were notified of the action taken by these six, and, at the same time, supplied with a copy of the report of the accountants, and a statement of the companies adopting the system prepared in accordance therewith. That was about all that was necessary. Soon the others "saw the light," for from then on the bankers took charge of the situation and refused in a number of cases to advance money to those companies whose statements were not prepared in accordance with the adopted system.

"Cost Finding" and "Cost Keeping"

This recital of the experiences of the brick industry is typical in that it illustrates the difficulty of obtaining concerted action on cost matters even though, in the final analysis, it benefits the manufacturers concerned. Cost accounting is fundamental and vital to the business health of the individual company or of the industry. There is this to be added, however, —there is a vast gulf separating "cost finding" and "cost keeping." Cost keepers usually keep their costs secret for so long that they are of little value to themselves or to anybody else. Conditions within most industries would improve considerably if those engaged in it could be persuaded to make their costs available to each other. If a man is making something cheaper or doing it better, he usually takes a justifiable pride in telling it to the world, but the man who is ignorant of his costs or doubtful of his methods usually is very secretive about them, because he is actually ashamed of them. There is no incentive which makes for quicker reform and better conditions generally than a familiarity with the methods used by others in arriving at their costs.

I. G. Farbenindustrie forms working agreement with Central Association of Chemical and Metallurgical Industry, Austria. The main provisions are that the I. G. Farbenindustrie has undertaken the sole sale of Austrian chemical products with the exception of mineral acids and fertilizers. On the Austrian home market the I. G. undertakes to sell Austrian products wherever available, whilst in the Jugo-Slavian, Bulgarian and Balkan markets the I. G. undertakes to market Austrian products to the extent of 20 per cent. of the home consumption of these materials.

Science and Sales

Attention is called to a process developed in Galicia for the preparation of valuable compounds from the refining wastes of cracked products, particularly cracked gasolines. The process is essentially one of neutralization with alkali and distillation. At one stage sodium plumbite is used as a purifying agent. Butyl, amyl, and hexyl alcohols as well as a base for making varnishes and lacquers are obtained. British Patent No. 309,718.

In the destructive distillation of solid fuels, the latter are subjected to low temperatures in the presence of halogens, halogen acids or compounds, such as bleaching powder, which yield halogens under the experimental conditions. It is claimed that high yields of light hydrocarbon oils are thereby obtained. This represents a novel use for chlorine and its compounds. British Patent No. 290,606.

A solution of potassium thiocyanate or potassium ferrocyanide is used to impregnate carbonaceous matter, such as wood, peat, lignite and the like. The impregnated wood is then dried, distilled at 300 to 350 degrees C, heated to bright redness in the absence of air for half an hour and leached with as little water as possible. A high activated charcoal is obtained. British Patent No. 292,566.

An improvement in the process of making bleaching powder is described in Chemiker Zeitung, 1929, volume 53, pages 321-2. Cooling is not necessary. The tower chamber system in which lime is rabbled over successively lower floors by means of arms on a central vertical agaft, the chlorine gas entering at the bottom and passing upwards, is found to operate just as well without cooling.

Zirconium silicate is the starting point in the manufacture of opacifying media by a process which consists in fusing the silicate with an equimolecular amount of calcium oxide, strontium oxide, barium oxide, magnesium oxide or zinc oxide in the presence of a small amount of flux. British Patent No. 306,019.

An interesting use of dehydrothioparatoluidine is as an ingredient of a dilute sulfuric acid pickling bath for use in the treatment of iron or steel. The presence of a small amount of this substance in the bath prevents the action of the acid on the metal. British Patent No. 309,314.

A protective covering for films is composed of celluloid solution, shellac solution, acetic ether and glacial acetic acid, acetic acid causing surface solution of the gelatin film resulting in a firm bond with the lacquer. German Patent No. 456,084.

A rayon mixture patented in British Patent No. 311,137 consists of soft soap, glycerin, potato meal or other colloidal substance such as egg albumen, gum tragacanth or agar-agar.

Sodium citrate is employed as an emulsifying agent in the manufacture of cheese products, the reagent being stirred into the cheese in the molten state. British Patent No. 300,113.

A mixture of sodium sulfide, sodium bicarbonate and carbon dioxide is employed for the purpose of producing wood pulp. United States Patent No. 1,705,827.

Vinyl acetate is used as a starting point in the manufacture of polymerized products which find use as adhesives and sizes. German Patent No. 471,278.

A mixture of lactic acid and of tartaric acid is used to obtain the characteristic silk rustle and handle on cotton and rayon. German Patent No. 472,604.

Chemical Marketing Methods

By Charles C. Concannon*

Chief, Chemical Division, Department of Commerce

THE International Economic Conference of the League of Nations is authority for the statement that the United States is the largest single factor in the world's chemical industries—accounting for approximately one half of the world's five billion dollar output of chemicals and claiming an increasingly large share in the billion dollars worth of chemicals that annually enter into foreign trade. In contrast with the community marketing methods of the cartel system, the American chemical industry has reached its present position through an individualism that is the direct antithesis of the European conception.

Replacing Older Methods

American chemical manufacturers have come to realize that the older selling methods must be replaced by carefully studied marketing policies and plans, directed along productive channels and supported by adequate sales promotion. Underlying all of this procedure is the necessity for exact knowledge—first of products, then of markets, buying habits and types of buyers, distribution methods and sales organization.

Chemicals are industrial raw materials made by one industry and consumed by another in the manufacture of a product in which the identity of the original chemical may be lost entirely. It is this relation that puts the merchandising of chemicals squarely into the field of industrial marketing where there are certain principles that are common to the solving of practically all merchandising problems. Those principles are four in number. First, there must be the determination of the market and its analysis on the basis of potential volume and profit. Second, the buying influences must be studied to ascertain which men control purchasing of the product and how it is bought. Third, there must be the sales organization and the machinery for approaching the market efficiently and economically. Fourth, and finally, there must be developed the selling appeals and sales promotion that relate the product directly to the self-interest of the buyer.

Doubtless there are almost as many ways of applying these principles as there are industries that make use of them. Many American manufacturers, including a number in chemical industry and a great many more in the field that supplies chemical engineering equipment and accessories, have found it convenient to develop their marketing policies and plans in the form of ten simple steps. No particular novelty is claimed for this procedure but since it is, in a way, typical of American marketing methods in general, we should consider this succession of steps in their relation to the chemical industry.

Analyzing the Markets

As the first step, the manufacturer analyzes the logical markets for his products and then rates them according to their size, importance and the potential returns from each industry. The chemical manufacturer begins his study with an analysis of his present sales by products in order to get a clearer idea of the relative demand for his output. Then follows an analysis of product sales with reference to the margin of profit in each in order to make certain that sales effort on each product is not out of proportion with the returns. Profits are sometimes sacrificed for volume without the manufacturer realizing the futility of that effort. But once the products are selected that promise the greater return, there must be still another sales analysis to determine the industries in which these can be sold most profitably. Too often a manufacturer finds that he has been wasting time and effort in selling to industries where the potential prospect is not sufficiently large to repay him for the development. In other cases selling costs may be prohibitive due to inaccessible markets, uneconomic buying practices or special sales resistance.

So far the manufacturer has been studying his past limitations as revealed by his own sales records. To measure his future prospects he must make use of an

*Abstracted from an address delivered before the International Advertising Ass'n, at Berlin, Germany.

outside yardstick and for this purpose he probably uses the figures of the U. S. Department of Commerce or the current statistics compiled by the trade associations, technical periodicals and various business bureaus. Fortunately in recent years the biennial statistics of the Census of Manufactures have been available in sufficient detail to enable the manufacturer to break down the basic industry figures in order to show the size of establishments, number of employees, or the number of motors and horsepower employed in manufacturing. These detailed figures are extremely helpful in rating the market in relation to the number of worthwhile prospects. Take, for example, the paint and varnish industry which is a potentially important market for industrial alcohol. The census figures show a total of 923 establishments with a total value of products of $470,736,264, but 276 of these establishments have an output of less than $100,000 and account for but 3.2 per cent of the total value of products. In the next class of census figures (output $100,000 to $500,000) we find 320 more establishments which account for 16.5 per cent of the total value of production. The remaining group of 227 plants, each having an output of over $500,000, accounts for 79.6 per cent of the total. Here then is where our alcohol manufacturer would concentrate his effort to obtain his maximum volume of sales. The census production figures therefore offer qualitative as well as quantitative measure of the opportunities for sales development.

Importance of Distribution Census

At present we lack comparable statistics on the disposition of commodities once they have been produced. This condition may shortly be remedied, however, for the last Congress authorized an entirely new departure in governmental statistical activity—the taking of a Census of Distribution. Referring to this important innovation in a recent address before the Merchants Association of New York, Secretary of Commerce Robert P. Lamont said: "One of the reasons we have not made more progress in increasing the efficiency of distribution is the fact that we have relatively little comprehensive information about the movement of commodities. It is believed by many students of business that more adequate information on the movement and marketing of commodities will enable business men to reduce the costs of operation very materially. It is believed that this new census will form the basis for a more thorough study of distribution and that as a result of these fundamental and basic figures it will be possible for trade associations and other organizations to compile much supplementary material which can be interpreted in the light of the comprehensive census statistics." Certainly the chemical industry stands ready to gain materially from any study of its distribution activities.

Having set up the markets on which the chemical manufacturer is to concentrate his sales efforts, he turns to the study of the buying influences on the products he has to sell. He can well ask himself such questions as the following:

Who in each plant of my customers is directly charged with the responsibility for the processes in which my products are used ? Whom do my salesmen have to convince of the quality of my products ? From whom does the order come ? Who originates it ? Who specifies the brand or manufacturer ? Is buying done by individuals or by groups ? If the latter, which men and how many men by title and responsibility must I reach with my sales story ? How can I reach these men most effectively ?

If in answering these questions the manufacturer is willing to go behind the scenes and seek out the real buyers by actual operating responsibilities rather than by titles, he will greatly have simplified his marketing problems.

It has been said many times that the chemical industry is its own best customer. The explanation for this statement is found in the unique degree to which the chemical industry is self-contained. The finished product of one branch of the industry often becomes the raw material for another. Thus the tar distiller produces a distillate that is refined by a chemical manufacturer and sold as a coal tar intermediate to other manufacturers for the production of dyes, explosives, rubber accelerators, plastics or photographic chemicals. The fertilizer manufacturer makes sulfuric acid, sells it to the coke plant for making ammonium sulfate, which is returned to the fertilizer plant for use as an ingredient in mixed fertilizer.

From the marketing viewpoint this close interrelation means that the chemical manufacturer must address his sales story to the same type of man who in his own plant is responsible for production. Thus maker and user speak the same language and are guided by the same knowledge of quality, properties and behavior. This proves of mutual value in the drawing of specifications and the framing of chemical contracts.

Building and maintaining a list of men who control buying in each industry is the next step in marketing. After the type of buyer has been determined, the compilation of the list becomes a matter of recording names obtained from reports of salesmen, trade directories associations and society membership lists. Prospect lists age rapidly and to be of value must receive continuous attention.

The Sales Organization

At one time chemicals in the United States were sold almost entirely through middlemen known as brokers or sales agents. Government regulation, quota allotments and other conditions of the war period brought the manufacturer for the first time into close relationship with his customers. Since then practically the whole American chemical industry has gone over to direct selling. The manufacturers have had to build competent sales organizations to

supply the service needs of the consuming industries. In selling technical products such as chemicals specialized knowledge of the buyer's problems is an absolute necessity. Thus sales engineers and technically trained service men are required to supplement and round out the work of the sales organization.

After the manufacturer has selected the markets on which he is to concentrate his selling effort, his territorial plan consists merely in setting up his sales organization in strategic locations to serve these markets most economically. The necessity for warehousing facilities and other arrangements for prompt and efficient shipping will also have a relation to the setting up of the sales territories. Many chemical manufacturers concerned with national distribution have found that the eight geographic ones corresponding to the principal freight rate territories of the Interstate Commerce Commission offer convenient units in which to break down their territorial problems.

The question of personnel ties in so closely with sales organization that I need only emphasize the increasing importance of having men on the "firing line" with suitable background of selling experience, supplemented and supported by technically trained specialists in research and engineering who can, if necessary, supply the buyer with the how, why, and wherefore in the application of the products within the customers' own plant.

So far in my discussion of these theoretical steps which the progressive chemical manufacturer must follow in setting up his marketing machinery, I have confined myself to market analysis, plans, policies and statistics, with all of which the Department of Commerce is in close touch because of its relation to industry. The remaining steps have to do primarily with sales promotion, which includes publication advertising, manufacturers' literature, special promotion, and sales keynote.

Advertising Chemicals

In the chemical field we have the engineering type of publication read by the men responsible for production, the research and scientific journals that serve the laboratory and research departments, and the trade and market papers that carry the news and current price changes of the industry. In addition, in the allied and consuming industries such as textiles, petroleum, paint and varnish and paper, there are many excellent industry publications that serve all interests within their more limited fields. Under the heading of manufacturers literature comes the usual range of catalogs, engineering handbooks and direct mail literature. Chemicals, *per se*, are not products that lend themselves to dramatic and spectacular advertising. Rather the manufacturer often finds it desirable to prepare and distribute highly technical data and reports on the properties and qualities of his materials, supplemented by flow sheets and working diagrams to educate the prospective customer in the profitable use of these chemicals within his own plant. Much of the manufacturers' literature in the chemical field is of this character.

Special promotion as it is interpreted here refers to the use of exhibits at the biennial and other expositions of chemical industries, the preparation of papers for conventions of engineering and scientific societies, talks at trade association meetings, sales conventions, etc. Chemical industries in the United States, because of a secretiveness inherited from earlier days, have done less along these special lines of promotion than have the equipment and accessory manufacturers within the same field. It is evident, however, that as the industry grows it must make greater use of all modern tools of sales promotion.

The last step in our marketing program and one which can conceivably be the most important is the development of the proper sales appeals. It is fundamental that these must tie the product directly to the self-interest of the buyer. Fear of loss or hope of gain will always have determining influence in chemical buying and the American manufacturers who have marketed their products most successfully have always driven home the ideas of improved operation, increased production and lower costs which result from better quality, performance and technical service.

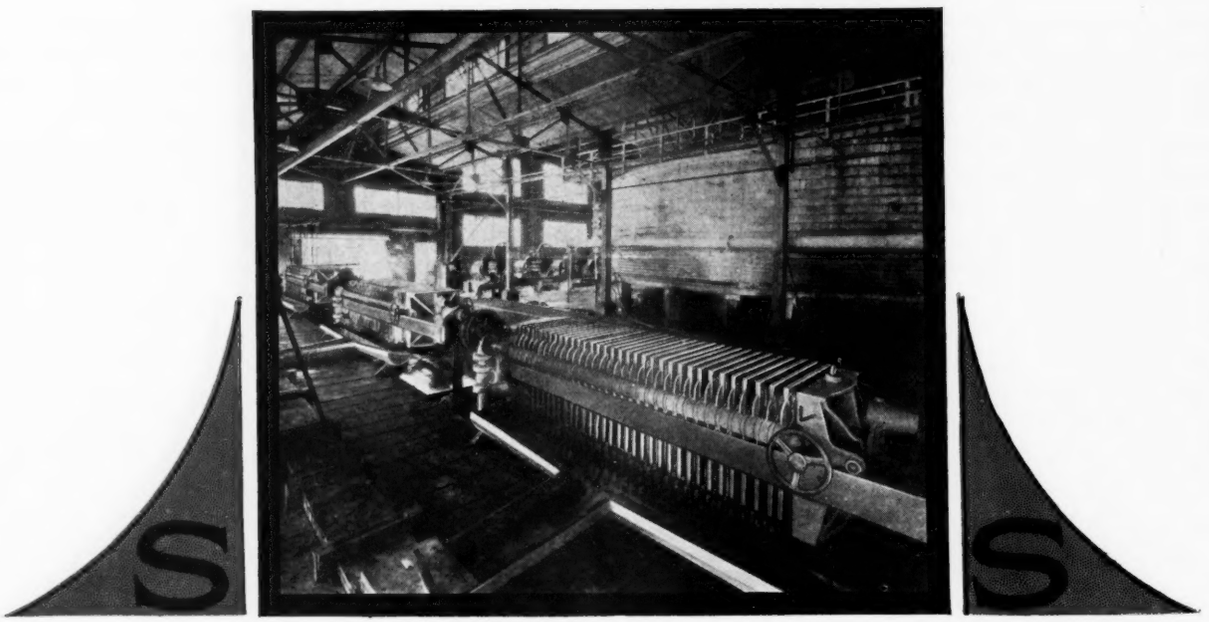
French State Nitrogen Factory Producing New Fertilizers

French State Nitrogen Factory, Toulouse, is producing several new fertilizers including ammonium nitrate, ammonium sulfonitrate, sulfonitrate of lime and ammonia, and nitropotash.

The first mentioned is a white salt containing 33.5 per cent of nitrogen. As it is somewhat hygroscopic in nature it is delivered in metallic casks which are perfectly tight. Sulfonitrate of ammonia is a mixture of the nitrate and sulfate and contains 25.5 per cent of nitrogen, of which 19 per cent is ammoniacal nitrogen and 6.5 per cent nitric nitrogen. Sulfonitrate of lime and ammonia is a mixture of ammonium nitrate and calcium sulfate. It is a white salt with a slightly yellowish cast and contains 7.75 per cent of nitric nitrogen, 7.75 per cent of ammoniacal nitrogen, and 18 per cent of lime. The final product mentioned above is a mixture of ammonium nitrate and potassium chloride containing 25 per cent of the latter. It is stated that these new fertilizers have met with a very good reception, particularly in the southern districts of France, and that deliveries have been made to Germany and to England.

World output of artificial silk in 1928, according to German calculations, was 347,400,000 lb., as compared with 266,868,000 lb. in 1927. Individual productions by the various countries of the world in 1928 and 1927 (the latter, in brackets) were as follows, in pounds weight:—United States, 98,650,000 (75,050,000); Great Britain, 52,000,000 (38,803,000); Italy 45,000,000 (36,000,000); Germany, 41,000,000 (31,000,000); France, 30,000,000 (21,000,000); Holland, 16,500,000 (unchanged); Belgium, 15,000,000 (13,500,000); Switzerland, 12,000,000 (10,340,000); Japan, 12,000,000 (8,000,000); Poland, 7,500,000 (4,000,000).

Canada imports 9,000,000 pounds of carbon black, valued at $600,000, from the United States in the first half of 1929. In 1928, total carbon black imports from the United States were 12,940,270 pounds, worth $853,230.



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Generated vs. Purchased POWER

By K. M. Irwin,
Mechanical Engineer, United Gas Improvement Co.

THIS article is intended to point out some of the factors which should be taken into consideration as to whether an industrial plant should purchase its power supply or manufacture its own power.

If the plant under consideration has little or no use of steam in its processes, and relatively a small amount of heating, it is generally more economical to purchase the power from a local utility. Even with a high use factor, such as the steam railroads have, the majority have found it advisable to purchase when they have electrified their service. The other reasons beside cost are described later in the article.

The cases in which steam plays a large part in the manufacturing offer a very much more complex problem. A decision in plants of this type should not be made until a study of the character, size, and type of the steam load have been painstakingly made. The magnitude of the steam load should be plotted against the hours of the day and the electric load superimposed on the same sheet in order to give a clear picture as to the coincidence of the two loads. Particular attention should be paid to seasonal variations in both loads and also idle period loads, such as nights, holidays and Sundays, as often the apparent savings of normal operation are wiped out by the uneconomical operation at these periods.

It would seem that the proper study of the relation of the steam and electric loads is such obvious procedure that it would not be necessary to emphasize its importance. Unfortunately, many cases have been and are still being found, where it is quite evident such studies have not been made.

Consulting engineers have been misled by clients' statements that their steam and electric loads are balanced and on the basis of this misinformation have recommended the building of plants and it is later found that through long periods of the day or night, loads are unbalanced and quantities of exhaust steam from the engine are blown to atmosphere. The incorrect assumption is often arrived at by weighing incorrectly the daily and seasonal variations, or by taking, as typical, a condition which does not exist for enough hours of the year.

The rapid advance in pressure for boiler plants in the last five years has opened up many opportunities for the industrial plant economically to generate its own power. Under the old standards of 200 to 300 lbs., if the process required steam at a pressure of 100 lbs. or more, little room was left for generating power from the steam before introducing it into the process. Many industrial plants are now using pressures up to 450 lbs., a few between 600 and 800 lbs., two at 1,000 lbs. and one as high as 1,800 lbs. The latter case is particularly extreme and is not the type of development that most industrial plants could afford to consider, as the equipment for this pressure has not been standardized and placed on the commercial

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market, and many things will have to be especially designed for use at this pressure.

A very interesting table showing the pressures and specific characteristics of these plants, together with a diagram of the power which might be obtained, is shown in an article by P. W. Swain in April 9, 1929 issue of "Power."

To select the initial or boiler pressure for a plant which is to generate power and supply steam for industrial purposes, if is necessary to list the steam uses, the quantities, and pressures desired. It can then be determined as to whether it is possible to use the steam in the process first and exhaust it into a back-pressure turbine and obtain the required amount of power. If by this method there is a power shortage, a mixed pressure may offer a solution—that is, a portion of the steam is taken directly into the turbine and the rest of the steam or exhaust from the process introduced into the lower stages of the same turbine.

Low Pressure Uses

When the industrial use of the steam is mostly for heating or for use at relatively lower pressure it is generally more economical to pass all the steam through the turbine first. With known requirements for exhaust steam it is then possible that the initial pressure can be raised sufficiently high so that there is enough pressure drop through the turbine to generate the power necessary.

The following tabulation will serve to show the quantities of steam required to generate one kilowatt hour with various initial and final temperature conditions. In each case the exhaust steam is dry saturated; the efficiency is assumed at 70 per cent.

600 lbs.	to	50 lbs.	dry saturated,	22.2 lbs.
300 "	"	50 "	" "	31.5 lbs.
150 "	"	50 "	" "	52.7 lbs.
150 "	"	atmosphere	"	25.6 lbs.

With this type of installation there is also the possibility of bleeding steam from the turbine for limited quantities at various pressures higher than that at which it exhausts.

If in the tabulation of steam uses it is found that a small proportion of the steam required is at 50 or 100 lbs. and the rest at 5 or 10 lbs., a bleeding type turbines permit getting the maximum power from the bulk of the steam by lowering the exhaust pressure to the five or ten pounds.

At practically no increased expense turbines can be purchased which are arranged for bleeding at two or three pressures.

New Types of Contracts

Due to the keen competition which high pressure in industrial plants is giving to the central stations, it has been necessary for the utility companies to broaden considerably their ideas in regard to the form of negotiations which they undertake with their customers. A great many companies in the past have been willing to agree only to a standard form of power contract, but in order to secure a large section of the industrial load, a number of power companies are now willing to make contracts of quite varying character in order to suit the particular problem of the plant with which they are dealing. The agreement sometimes takes the form of having the industrial install a generating plant and selling electric power to the central station at such times of the day when the steam required by process produces more power than the industrial plant itself can absorb, and having the the industrial purchase power form the central station company during such times of the day or year when the electric load of the industrial exceeds the demand which the steam can generate.

Other Values Considered

Other agreements have lately been made in which the industrial plant buys steam from a central station or from a steam heating company. This is done in crowded districts where the value of land and building is high and the industrial plant is enabled to save the building space and investment for a boiler plant which is relatively large, but can well afford to install generating equipment which does not take up as much room as boiler equipment and generate its own power from purchased steam. Another advantage in this form of agreement is that it eliminates both the coal and ash nuisance and also stack dust nuisance. The health authorities, especially in cities, are becoming more rigid in their requirements, so that the dust nuisance is not only a cause of annoyance but is likely to cause considerable expense to eliminate it.

Another very unusual type of contract has been recently negotiated wherein the industrial plant purchases heat units at the outlet of the boilers in the central station company's boiler room and pays to the central station the investment costs of installing a high pressure turbine in the central station's turbine room. The industrial gets, as a result, all the power which is made by having steam pass through this turbine, and in addition the exhaust steam from the turbine is piped to the industrial plant, the load on the turbine being governed by the industrial plant's requirements for exhaust steam, and surplus power generated sold to the central station or the deficiency made up by purchase from the central station. Of course, as an inducement for central station companies to consider these special arrangements, it is necessary for the industrial to have relatively large load, otherwise the special investment necessary in order to accommodate such cases would outweigh the economic balance.

The Costs Measured

If, after examining the various possibilities, first of generating power, second purchasing from central station, either under the standard form of power contract or by some special arrangement as may be

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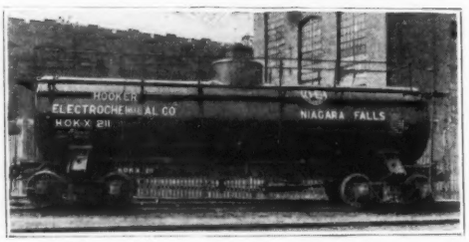

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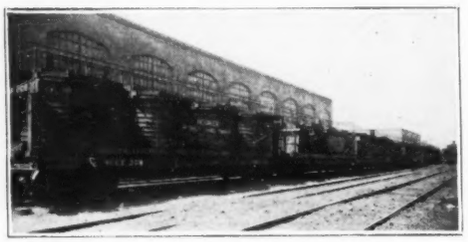

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arrived at, the owner of the industrial plant is confronted with the fact that he can make a small saving by installing the equipment himself, or the costs practically break even in installing his own plant, he should bear in mind that there are certain other distinct advantages in the outside purchase of power.

The first of these is that he is then able to conserve his capital and reinvest it in his own business, which will probably give him a larger return than that which he can obtain by entering into the power business on a small scale for his own use.

Second, due to the rapid development in the last decade of the art of power generation, those manufacturers who have held off making investment for power plant facilities are in a much better position now to get more economical equipment than they would have been in a few years previous, and it is only reasonable to expect that this development will continue.

Savings Appraised

With the power companies rapidly increasing loads they do not suffer the same handicap by having to use older equipment, as this is relegated to peak load service (where its number of hours' use is relatively short) or to reserve service. On the other hand, the industrial plant loads are not growing as rapidly and they, of necessity, have to continue using equipment throughout the long hours of use, regardless of economy. This advance in the art is also allowing the central stations to modify their rate schedules and although a privately owned plant may show a certain per cent saving over purchasing power under to-day's schedules, there is no assurance that that same saving can be realized a few years hence, as it may be possible that power companies' schedules will be so revised as to wipe out what might have been a saving.

Third, the reliability of service from the central station has been so materially increased as well as their numbers of feeders and plants that for a privately owned plant to have the same factor of reliability it is necessary to install a considerable amount of reserve equipment. This is particularly true in such industries as cover large areas, where it is possible for central stations to feed them at several points out of different substations and from different circuits; whereas the industrial plant would have to confine itself probably to one source of supply, and would also suffer the handicap of distribution through out its property.

New Developments

Changes and developments, of course, are not confined to power generation, and industrial plants are finding that their processes are also rapidly changing due to varying their product, adding products or by-products, adding processes, or having certain processes done at other plants or discontinuing certain products or processes. Any of the changes are sure to effect a change in the requirements for steam or power and the possibility of having to scrap power generation equipment as being unsuitable for the new conditions and being faced with the necessity of a further outlay of capital for new equipment. The purchase of power, of course, safeguards the manufacturers against this contingency.

New Plant Construction

Niacet Chemical Co., Niagara Falls, N. Y., plans construction of plant additions to increase acetic acid capacity one hundred per cent. A number of small buildings are involved in the construction project. These will be erected at a cost of $150,000 and when completed will represent, with equipment, an investment of about $1,000,000.

Consolidated Mining & Smelting Co. of Canada, Ltd., is constructing a nitrogen fixation plant at Trail, B. C., to cost between $7,000,000 and $8,000,000. It is reported that the erection of this plant is connected with the recent international nitrogen agreement between the I.G., I.C.I., and Chilean producers.

Celanese Corp. of America completes plans for construction of new three-story, reinforced concrete solvent recovery unit at its Cumberland, Md., plant. It will cost approximately $160,000 with machinery.

Triangle Chemical Co., New Westminster, B. C., begins reconstruction work on portion of plant destroyed by fire with estimated loss of $65,000.

Merrimac Chemical Co. approves plants for construction of addition to Everett, Mass., plant to be one-story and cost about $50,000.

Standard Wholesale Phosphate Co., Baltimore, plans construction of one-story addition to Williamston, N. C., plant, reported to cost over $100,000 including equipment.

Carbide & Carbon Chemicals Corp. approves plans for building of new one-story branch plant at Madison, Wis., to cost approximately $35,000 with equipment.

General Chemical Co. plans construction of a one-story addition to its Buffalo plant to cost about $28,000 with equipment.

Palatine Aniline & Chemical Corp., Poughkeepsie, plans to rebuild portion of building destroyed by fire with estimated damage of $100,000.

Aluminum Co. of America completes construction of new plant at Alcoa, Tenn., at cost of $200,000.

Union Carbide & Carbon Corp. plans to open plant at Buffalo in November for manufacture of methanol and synthetic alcohol.

American Cyanamid Co. begins work on projected $4,000,000 plant near Tampa, Fla.

American Molasses Co. plans erection of addition to alcohol and molasses plant to cost about $1,000,000.

General Industrial Alcohol Co. plans erection of warehouse and wharf addition to alcohol plant in Marrero, to cost about $50,000.

Bakelite Corp. purchases 150 acres of land at Bound Brook, N. J., upon which it plans to erect a plant.

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TEXTILE—a petroleum thinner for use in replacing Benzol, Toluol, and other coal tar solvents; has the same evaporating time as Benzol; widely used by large industries, artificial manufacturers, textile manufacturers, etc., as a substitute for Benzol; more efficient and more economical.

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Handling Less Carload Shipments

By Morris Forgash

Assistant Freight Traffic Manager, Universal Carloading & Distributing Co.

Freight forwarders throughout the country handle about 400,000,000 pounds of less-than-carload package freight each month. It is estimated that during 1928 they enabled less carload shippers to save approximately $5,000,000 in transportation charges. That the forwarder serves a definite economic need is obvious and shippers of chemicals will profit by familiarizing themselves with this type of service as outlined by Mr. Forgash.

THE history of the forwarding agent, or freight forwarder as he is commonly known to-day, dates back to the early days of America when stage coaches, sailing vessels and canal boats were the only means of conveyance. The steam engine had not been invented, the country was sparsely populated and fully three quarters of its territory was impenetrable wilderness.

In those days industry was more or less localized. Having very little intercourse with the outside world, each community centered its efforts on supplying the wants of its own members through its local manufactories. Up to the first quarter of the 19th century, or prior to the advent of the steam railroad, the United States was a vast territory made up of many towns and hamlets, each of which was practically self sustaining and independent of the other. Commerce between the various communities progressed very slowly. This condition was in a large measure due to the methods of transportation which were then in vogue.

These methods were indeed slow, costly and tedious. There were no time-tables or schedules, as we know them to-day, governing the arrivals and departures of the carriers. Nor can it be said that such measures of efficiency could have been of much avail. Inclement weather and poor roads rendered the arrivals and departures very uncertain and, of course, over those conditions the carriers had no control.

It is very obvious that a merchant doing business in those days could not afford to stay with his goods awaiting the arrival of the carriers. The transportation of his merchandise by horse-drawn vehicles or beasts of burden from the interior to the port of call was a task in itself. It became necessary, therefore, to designate someone operating a business along the route, or at the terminus of the road or river, as a forwarding agent or freight forwarder to keep the merchandise in his possession for the account of the shipper, and later turn it over to the carrier for transportation to its final destination. He also re-received shipments from the carrier and held them until circumstances permitted the consignee to call for his goods. The forwarder quite naturally charged a fee for his services, which however was not standard. It was based upon the size of the shipment, the shipper's ability to pay, or both.

That the early freight forwarder played an important part in the economic development of the country cannot be denied. He was indeed a vitally necessary intermediate between shipper and carrier.

Through various evolutionary stages, the early freight forwarder just described, finds his counterpart in the freight forwarder or consolidator of to-day. While they are both similar in principle in that they are intermediate between shipper and carrier, they differ vastly in methods. The early forwarder operated in connection with horse-drawn vehicles and

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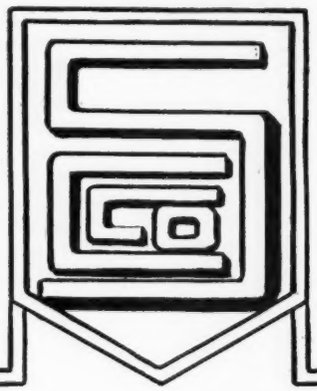

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water carriers; the forwarder of to-day restricts himself in his operations over steam and electric railroads and uses two mediums for the conduct of his business—the box car and the steel shipping container, both of which will be explained briefly in the order that they appear.

Principles of Freight Consolidation

Briefly defined, freight consolidation, as it is carried on to-day, is the application of modern engineering principles of mass production to the physical handling, transportation and distribution of less-than-carload package freight.

In most cases railroad freight rates are based upon classification of commodities. It has been estimated that at least 30,000 different kinds of articles are being transported by the carriers every day. A considerable portion of these commodities are provided with two ratings which govern the assessment of the charges, namely, carload and less-than-carload. The forwarder gathers together less-than-carload shipments from various shippers and consolidates them into solid carloads, each car being made up of articles taking similar carload classifications. He forwards them to destination consigned to his own branch or agent, and for the transportation service pays the carrier the carload rate. The carrier can afford to transport a carload quantity of merchandise for a considerably lower price than a smaller quantity in that he is selling his transportation in volume. It is, in reality, the wholesale and retail principle of merchandising applied to transportation service.

Upon arrival at destination the cars are unloaded and the consignees promptly notified to call for their merchandise. Upon request the forwarder performs

A container car with six containers, showing the impossibility of opening while on car.

store door delivery at a nominal charge. The shipper or receiver receives the benefit of a certain differential under the regular less-than-carload railroad rate, which he would ordinarily be obliged to pay the carrier when shipping his merchandise direct. To further enlighten the reader, it may be interesting to cite a specific example of the savings in transportation charges that are available when shipping in a consolidated car. Let us take a less-than-carload shipment of drugs packed in cases from New York to Chicago. This commodity classifies first class in less-than-carload quantities and third class in carloads, the minimum carload weight being 30,000 pounds. When shipping direct, the shipper would be obliged to pay the carriers their regular first class tariff rate of $1.42 per 100 lbs. The forwarder consolidates the shipment, together with other commodities taking the same carload rating, into a solid carload of 30,000 pounds and pays the carrier on the basis of their

Tractor and trailer equipment used in transferring containers between warehouse and gantry crane.

regular third class rate of $.94½ per 100 lbs. He charges the shipper a rate of $1.26, indicating a net saving of sixteen cents per 100 lbs., or approximately 12½ per cent of the freight rate.

The difference between what he collects from the shipper or the receiver and the amount that he pays the carrier on the basis of the carload rate constitutes the forwarder's gross profit, out of which he must meet his overhead expenses, such as rents, salaries, labor costs, etc. The responsible forwarder also sets aside a certain portion of his profits as a claim reserve and also carriers sufficient insurance for the protection of his patrons.

Advantages to Shipper and Receiver

The saving in freight charges, however, is not the only important item. There is also a considerable saving in time in transit. Less-than-carload shipments moving in consolidated cars receive the benefit of through carload movement from point of origin to point of destination without transfer enroute. The many handlings and transfers that a shipment undergoes ordinarily are eliminated, thus reducing the possibilities of loss, damage and pilferage to a minimum.

While merchandise is in transit it represents a tie-up of capital. Whoever owns the merchandise cannot convert it into cash until it reaches its destination. In reducing the time in transit, therefore, the forwarder serves a definite economic need in placing the merchandise into the hands of the buyer for turnover in the quickest possible time.

The forwarder also keeps a record of the movement of all cars and follows them through the various gateways, thus precluding the possibility of side-tracking

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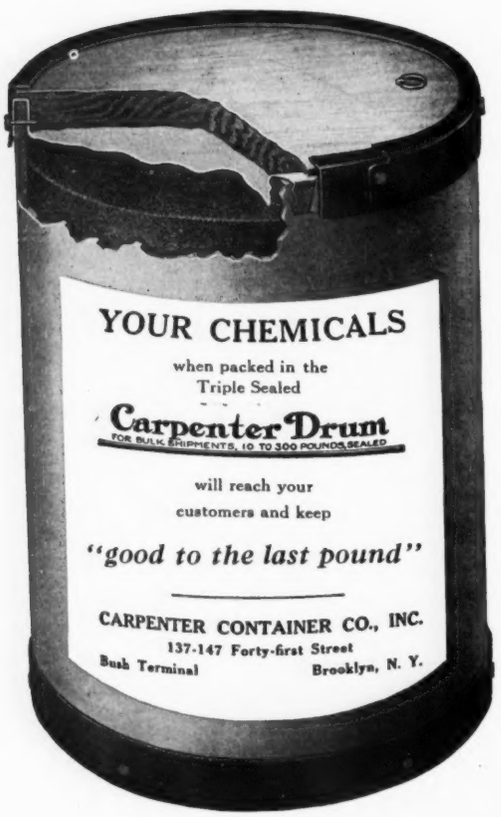

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in transit. Through his close follow-up of his cars he is able to readily time the arrivals at destination.

Another advantage in the use of consolidated cars lies in the ability to secure prompt tracing information from the forwarder. The average consolidated car contains 40 individual shipments. A large percentage of these shipments require prompt dispatch, and, if shipped local freight, would be subject to tracers instituted by shippers or consignees. When shipped in consolidated cars the desired results on 40 shipments are secured by tracing one car.

Advantages To Carriers

Practically all railroad companies to-day are in uniform accord with the functions of the freight forwarder. Being of benefit to them, the forwarder is quite naturally an economic necessity to the public at large.

It is a matter of common knowledge that the handling of the less-than-carload package freight by the carriers in their own merchandise cars entails a tremendous amount of detail that is not at all commensurate with the profits realized. In the first place, they are invariably obliged to rehandle such freight at transfer points where through cars are made up for various destinations. This re-handling of freight at transfer points represents one of their large items of expense.

These additional handlings unavoidably reflect themselves in a larger number of claims for loss, damage and pilferage. While it is an admitted fact that the railroads have made remarkable progress in recent years along the lines of claim prevention work, approximately 30 per cent of their total claims are still being paid out on less-than-carload business, whereas their claims on the same class of traffic moving in consolidated cars have been reduced to a tremendous degree.

A typical station operated by the Universal Carloading and Distributing Co. equipped with interior shop crane where box cars, containers and trucks are all under one roof.

Bookkeeping is also an expensive part of their detail work. It has been estimated that the cost of handling a waybill through a local freight agent's office and accounting department is 23 cents. This may not appear to be a large item of expense on the surface, but, when it is considered that the average merchandise car of Class 1 railroads during the year 1927 contained approximately 12,000 pounds, and that the average weight of a less-than-carload shipment was 204 pounds, or an average of 58 items per car, the expense in waybilling runs into a very appreciable figure. On the other hand, the average weight of a consolidated car is 38,000 pounds. If this same quantity of freight were handled by the carriers in their own merchandise cars, the cost in waybilling would be approximately $42.00, as against a cost of 23 cents in waybilling a consolidated car.

View at railroad station in New York City showing containers on trailers ready for loading and unloading.

The carriers' lower cost per ton mile in hauling a consolidated car as against one of their own merchandise cars is also very obvious. It costs practically as much to haul an empty car as it does to haul one that is fully loaded.

Further to emphasize the economy on the part of the carrier in handling consolidated cars, it should be borne in mind that all the work of solicitation, segregation and concentration is performed by the forwarder at his own expense.

Freight Consolidation in Steel Shipping Containers

Another medium of transportation used by freight forwarders in the consolidation of less-than-carload package freight is the steel shipping container. Although in operation but a few years, the container has already established itself as being a vital and necessary part of our transportation system. It was first developed and placed in operation by the New York Central Railroad in 1921.

The container is a steel box having a cubical capacity of 438 cubic feet, a maximum loading capacity of 10,000 pounds, and is placed for transportation in batteries of five, six or eight in specially constructed cars. It is of waterproof construction and on one side is provided with a tightly fitting door equipped with a locking device. The outside dimensions are: 9 feet long, 7 feet wide and 8 feet high. The weight of the container empty is 3,020 pounds.

Through this new method of handling package freight, theft enroute is entirely eliminated. The door of a container cannot be opened while it is resting on

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the car floor. The container must be lifted bodily onto platform or warehouse floor, and this can be accomplished only by means of powerful cranes. For the first time in the history of transportation there is available a medium that is an absolute assurance against the possibilities of theft and pilferage enroute.

The possibility of damage to freight in containers while enroute is also very remote. It has been demonstrated that the possibilities are one sixth as compared with box car loading owing to the fact that the freight is loaded into separate and distinct compartments which has the tendency of breaking up vibration and sudden jolts enroute. Moreover, the loading of merchandise in these smaller units of space necessitates a more scientific stowage of the various articles, thus reducing the possibilities of the general shifting of the load to an absolute minimum.

Reducing The Fire Hazard

In reducing the hazards of fire, the container has further demonstrated its practicability. As is generally the case, in the event of spontaneous combustion in a box car, the fire sweeps throughout the car and destroys practically the entire contents. Whatever merchandise is not entirely destroyed is usually contaminated by the smoke or badly damaged by the heat that is generated. On the other hand, in the event of a fire in a container it is confined to the particular one in which it occurs, while the remaining containers on the car would be unharmed. It would be pertinent to state here, however, that the possibilities of spontaneous combustion in a container are very remote because of its airtight construction.

These containers can also be used by shippers having a sufficient quantity of merchandise to ship in one business day. Under the provisions of the tariffs that are in effect at the present time, the shipper and receiver must load and unload containers on their own premises and cart them between their place of business and the crane at their own expense. The charges are figured on a mileage basis, beginning with 5 cents per mile per container of 4,000 pounds and increasing ¼ cent per mile per container for each additional 500 pounds or fraction thereof, graduating up to a maximum cost of 8 cents per mile based upon the maximum load of 10,000 pounds.

The container enables the forwarder to further extend his operations for the accommodation of all classes of merchandise, with or without carload ratings, because of the fact that his costs are figured on a mileage basis, whereas a classification basis is the underlying principle of box car operation.

After several years of actual operation and careful study of the costs and conditions involved in the handling of containers, the forwarders have evolved a scientific basis of class rates which gives the shipper or the receiver, who is unable to make use of the container direct, uniform differentials of 10 per cent, 8 per cent, 6 per cent, 4 per cent, 6 per cent and 4 per cent on 1st class, 2nd class, 3rd class, 4th class, Rule 25 and Rule 26 respectively.

The following cities are now receiving the benefits of container car services: Baltimore, Boston, Buffalo, Cleveland, Erie, Newark, New York, Pittsburgh, Wilkes Barre, Rochester, Springfield, Syracuse, Utica.

Based upon the experiences of the carriers who have adopted the container car method of handling package freight in the above cities, where it has fulfilled every expectation, plans are now under way for the extension of this service to other large business centers. It is expected that it will be available to the shipping public in the principal cities located between the Atlantic Seaboard and the Middle West, up to and including Chicago and St. Louis, in the not too distant future.

Freight Rate Decisions

New York Public Service Commission has approved for the New York Central (East) Railroad new freight rates on caustic soda, bleaching powder, washing powder and drainpipe solvent, carload, from Albany to Thirty-third street, this city, the minimum carload weight in connection with the commodity rate of 13.5 cents per hundredweight being reduced from 50,000 to 40,000 pounds. This change is effective September 8.

Commission also approves for the Delaware, Lackawanna & Western Railroad a reduced freight rate of 13.5 cents on sal ammoniac in bulk, in bags or barrels, carload, minimum weight in barrels, 40,000 pounds, and in bags, 50,000 pounds, from Solvay and Syracuse to Buffalo, Niagara Falls and Suspension Bridge, on Lehigh Valley.

A reduced rate of 13.5 cents per hundredweight on sal ammoniac has also been approved for the New York Central (East) and West Shore Railroads, from Solvay and Syracuse to Niagara Falls and Suspension Bridge. These reductions are effective September 8.

Commission further approves cancellation by the Delaware, Lackawanna & Western Railroad of commodity freight rates on soda crystals and washing soda, carloads, from Solvay and Syracuse to stations on the Delaware & Hudson and Cooperstown & Charlotte Valley lines. Class rates are restored, effecting increases, from August 26.

A reduced freight rate of 26½ cents per hundredweight on soda silicoaluminate has been approved for the New York Central Railroad (East) to apply to carload shipments, minimum weight in bags or in bulk 50,000 pounds, in iron drums 40,000 pounds, from Lockport to Boston & Albany stations, Canaan to Hudson upper, inclusive, and Chatham Center to Brookview, inclusive. It is effective August 25.

Steel drums used in the transportation of certain chemicals will not be classified for free entry to the United States unless it is conclusively shown that the drums are of domestic manufacture, and thus privileged for free entry, the Commissioner of Customs, F. X. A. Eble, informed the Customs Service in a circular made public August 3.

In the letter, in answer to an inquiry of the collector of customs at Seattle, the Commissioner stated that at some ports it is the practice to allow free entry on drums stamped with the letters "ICC," holding that these letters are sufficient evidence that the containers are of American origin. "It is believed that these letters mean only that the drums have met the requirement of the Interstate Commerce Commission with regard to the containers for use in the transportation of merchandise within the limits of the United States," he stated.

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Soviet Russia Reports Progress of Nationalized Chemical Industry

Soviet Union's chemical industry has made rapid progress during the past five years. The heavy chemical industry—which includes crude chemicals, wood distillation, coal tar, aniline dyes, paints and varnishes—has expanded during the past years at a particularly rapid rate. This can be seen from the following table showing gross production in thousand rubles at wholesale prices:—

Production in Thousand Rubles

Branch	*1924-25*	*1925-26*	*1926-27*	*1927-28*	*Per cent of 1924-25*
Crude Chemicals	42,814	57,345	68,945	81,559	190.5
Paints and Varnishes	25,435	39,858	36,272	44,788	176.0
Aniline Dye Industry	11,914	24,744	28,270	34,649	290.8
Wood Distillation	2,364	3,956	6,030	8,529	360.7
Coal Tar Industry	8,600	11,451	14,382	16,882	196.3
Total	91,127	137,354	153,899	186,407	204.5

In spite of its development during recent years, the chemical industry is still unable to satisfy the steadily growing demand, and in the current financial year will be able to satisfy the requirements only to the extent of 72 per cent, according to the Bank for Russian Trade, London.

The wood distillation industry, which is based on the enormous timber resources of the Soviet Union, is now also being considerably developed, and plans have been adopted to extend the production of acetic acid, acetone and similar products, while the manufacture of turpentine, colophony and similar products has already been started. The five-year plans elaborated for this industry provide for the erection of thirteen new factories, to be concentrated chiefly in the Urals. Acetic acid will be the principal article to be produced by them.

The production of fertilizers is now more than three times as great as before the war, yet only part of the demand can be satisfied. The total output of fertilizers in the current year is estimated at 378,000 tons as compared with 209,000 tons in 1927-28 and 135,000 tons in 1926-27. The output in the current year will consist of 260,000 tons of superphosphates, 60,000 tons of ground phosphorite, 31,700 tons of ground bone, 7,100 tons of nitrates and 19,200 tons of ammonium sulfate. The discovery of the large potash deposit at Solikamsk in the Urals has opened up wide possibilities for this industry and exploitation of the deposit has already been started. The production of nitrates will be greatly extended after the completion of the Dnepr Hydro-Electric Station, in the vicinity of which a number of nitrate works are to be built in order to utilize the cheap power from it. A number of other chemical factories are planned in the same district.

Large investments have been made in the chemical industry during the past five years for the construction of new factories, re-equipment and capital repairs to the existing works. The following table shows investments and the estimates for the current financial year in rubles:—

Year	*Rubles*
1923-24	5,220,000
1924-25	14,700,000
1925-26	48,310,000
1926-27	60,100,000
1927-28	73,100,000
1928-29 (Estimates)	146,800,000
Total	348,230,000

In October, 1927, the All-Union Chemical Syndicate was formed with the object of stabilizing the chemical market, unifying the commercial machinery of the chemical trusts, extending the selling agencies and popularizing the use of chemical goods, particularly of fertilizers, in the Soviet Union. The trade turnover of the Syndicate amounted in 1927-28, which was the first year of its existence, to 113.9 million rubles, and the estimates for the current 1928-29 financial year are 230 million rubles. The paid-up capital of the Syndicate is 10 million rubles.

Chemical Facts and Figures

Senate Finance Committee Reports on Tariff Bill

Senate Committee Revision Generally Downward As Compared With House Schedule—On Schedule 1, Ad Valorem is 29.83 Per Cent as Compared With House Bill of 32.34 Per Cent and Present Tariff of 29.32 Per Cent.

Senate Committee on Finance, Senator Reed Smoot, (Rep., Utah) chairman, reports to the Senate, its revision of the tariff schedules which the House of Representatives passed May 28. The Senate committee revision is generally downward as compared with the schedule passed by the House, but higher than rates in the present tariff. The comparison as regards Schedule 1, Chemicals, Oils and Paints, is as follows, according to statement made public by Senator Smoot: Act of 1922, approximate revenue, $27,686,466, equivalent ad valorem, 29.32 per cent; House Bill, $30,534,735, ad valorem, 32.34 per cent; Senate Revision, $28,167,942, ad valorem, 29.83 per cent. The committee also recommended that language be written into the proposed bill directing the Tariff Commission to convert the prevalent ad valorem duties on foreign value into equivalent percentages on the domestic value plan.

Reed Smoot

The Committee's revisions as compared with the House bill and with the existing tariff, are as follows on chemical and allied products:

Citric Acid—Present rate 17 cents a pound, House rate 18 cents, Senate Committee rate 17 cents. Tannic Acid (Containing by Weight of Tanic Acid Less Than 50 Per Cent)—Present rate 4 cents a pound, House rate 6 cents, Senate Committee rate 4 cents. Tannic Acid (More Than 50 Per Cent, Non-Medicinal)—Present rate 10 cents a pound, House rate 12 cents, Senate Committee rate 10 cents. Tannic Acid (More Than 50 Per Cent, Medicinal)—Present rate 20 cents a pound, House rate 22 cents, Senate Committee rate 20 cents. Gallic Acid—Present rate 8 cents a pound, House rate 10 cents, Senate Committee rate 8 cents. Nitric Acid—Now free, House rate ½ cent a pound, Senate Committee rate. Oxalic Acid or Red Oil—Present rate 1½ cents a pound, House rate 1½ cents, Senate Committee rate 1½ cents. Paragallic Acid—Present rate 12 cents a pound, House rate 15 cents, Senate Committee rate 12 cents. Amber and Amberoid—Present rate $1 a pound, House rate $1, Senate Committee rate 50 cents. Caffeine—Present rate $1.50 a pound, House rate $1.50, Senate Committee rate $1. Caffeine Citrate—Present rate 25 per cent ad valorem, House rate 90 cents a pound, Senate Committee rate 60 cents.

Calcium Carbide—Present rate 1 cent a pound, House rate 1 cent, Senate Committee rate ½ cent. Carbon Tetrachloride—Present rate 2½ cents a pound, House rate 2½ cents, Senate Committee rate 2 cents. Chloroform—Present rate 6 cents a pound, House rate 6 cents, Senate Committee rate 5 cents. Tetrachloroethane and Trichloroethylene—Present rate 35 per cent ad valorem, House rate 35 per cent ad valorem, Senate Committee rate 25 per cent ad valorem. Casein or Lactarene—Present rate 2½ cents a pound. House rate 2½ cents, Senate Committee rate 3½ cents. Chalk, Whiting, or Paris White Ground in Oil (Putty)—Present rate 3¼ cents a pound, House rate ¾ cent, Senate Committee rate 1 cent. Vanillin, From Whatever Source Derived—Present rate 45 per cent ad valorem House rate 45 per cent ad valorem, Senate Committee rate 45 per, cent ad valorem of selling price and 7 cents a pound. Synthetic Indigo and Sulfur Black, Color Indices 1177 and 978—Present rate 7 cents a pound and 45 per cent ad valorem, House rate 7 cents and 45 per cent, Senate committee rate 3 cents and 20 per cent. Mixtures Cellulose and Compounds, Transparent Sheets from 3-1000th Inch to 32-1000th—Present 40 cents a pound, House rate 45 cents, Senate committee 50 cents. Iodine—Present rate 20 cents a pound, House rate the same, Senate committee rate 10 cents a pound resublimed.

Epsom Salts—Present rate of ½ of 1 cent a pound, House rate 1 cent, Senate committee 1½ cents. Keiserite—Free at present. House rate ¼ of 1 cent a pound, Senate committee free. Menthol—Present rate, 50 cents House rate 75 cents, Senate committee 50 cents. Synthetic Camphor—Present rate 6 cents, House rate 1 cent, Senate committee rate 6 cents. Linseed or Flaxseed Oils and Mixtures—Present rate 3 3-10ths of 1 cent, House rate 4 16-100ths of 1 cent, Senate committee 3 7-10ths of 1 cent. Olive Oil, WGY, With Container, Less Than 40 Pounds—Present rate 7½ cents a pound, House rate 8½ cents, Senate committee 7½ cents. Soy Bean Oil—Present rate 2½ cents a pound, House rate 5 cents, Senate committee 2 8-10ths of 1 cent (but not less than 45 per cent ad valorem). Ultramarine Blue, if Valued at More Than 10 cents a Pound—Present rate 3 cents, House rate the same, Senate committee rate 4 cents. Ultramarine Blue, if Valued at 10 Cents a Pound or Less—Present rate 3 cents, House and Senate committee rates the same. Bone Black or Char and Blood Char—Present rate 20 per cent ad valorem, House rate 25 per cent, Senate committee 20 per cent.

Potassium Citrate—Present rate 25 per cent ad valorem. House rate 18 cents a pound, Senate committee rate 15 cents, Chlorate and Perchlorate—Present rate 1½ cents a pound, House rate 2¼ cents, Senate committee 1½ cents. Saltpeter—Present rate one-half of 1 cent a pound, House rate 5½ cents, Senate committee 1 cent. Sodium Chlorate—Present rate 1½ cents a pound, House rate the same, Senate committee rate 2 cents. Sodium Citrate—House rate 15 cents a pound, Senate committee rate 12 cents. Sodium Phosphate (Except Pyrophosphate), Less Than 45 per cent Water by Weight—Present rate 1½ cents a pound, House rate 1 cent, Senate committee 1½ cents. Sodium Phosphate (Not Specially Provided for)—Present rate 1½ cents, House rate 2 cents, Senate committee three-quarters of 1 cent. Silicofluoride—Present rate 25 per cent on American selling, House rate 1¾ cents a pound, Senate committee rate 1½ cents. Sulfide, Containing Not More Than 35 per cent Sodium Sulfide—Present rate three-quarters of 1 cent a pound, House rate the same, Senate committee rate 1 cent. Sulfite, Bisulfite and Metabisulfite—Present rate three-eighths of 1 cent a pound, House rate the same, Senate committee one-half of 1 cent. Molasses Not Imported for Human Use—Present rate 1-6 of a cent a gallon, House bill 3-100 of a cent a gallon, Senate committee 3-100 of a cent a pound of total sugars.

Helium is discovered at Thatcher, Colorado, in a natural gas of which the helium content is reported to be 210,000 cubic feet per day. A Government helium plant erected some years ago at Dexter, Kan., is being moved to Thatcher.

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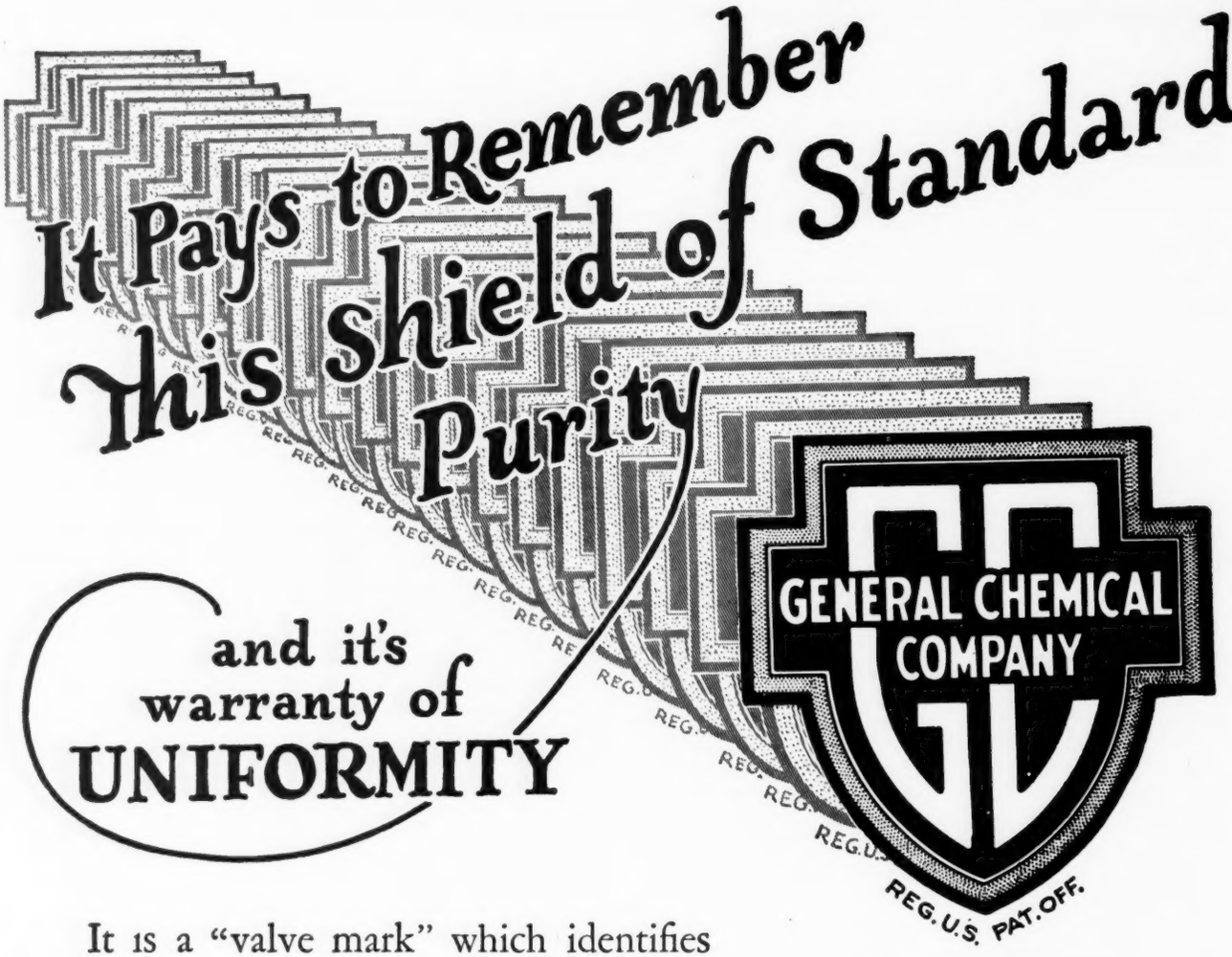

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Personal and Personnel

Harold H. Hall, since 1912 New York manager for Arnold, Hoffman & Co., Inc., Providence, retires from business August 1, after 41 years with the organization. He first came with the company, which was then Mason, Chapin & Co., in 1888, at which time he handled importations of English bleaching powder at Boston.

He is succeeded as manager of the New York office by Charles L. Berntson, whose former territory in New York and adjacent states has been taken over by Harold E. Becker.

Lord Melchett, chairman of the board, Imperial Chemical Industries, Ltd., is elected chairman of the council, British Empire Producers' Organization, which for many years has endeavored to link together various manufacturers and producers of foods and raw materials in many parts of the British Empire. Lord Melchett is also the subject of a biographical sketch in the August 1 issue of *"The Dyer and Calico Printer"*, London.

R. R. Deupree, formerly vice-president and general manager, Proctor & Gamble, is elected president, succeeding William Cooper Proctor, who asked to be relieved from active direction and was elected chairman of the board.

J. E. Lockwood, director of sales, naval stores division, Hercules Powder Co., is appointed a member of a special committee of the United States Chamber of Commerce to inquire into unfair trade practices.

George S. Rice, chief of mining engineering, U. S. Bureau of Mines, is awarded the medal of the Institution of mining Engineers, London.

E. M. Sessons, vice-president, Consolidated Naval Stores Co. is elected to the executive committee, Naval Stores Marketing Corp., Jacksonville.

Wm. McPherson, dean, department of chemistry, Ohio State University, is chosen president-elect, American Chemical Society, succeeding Dr. Samuel W. Parr, resigned.

J. W. Dunning, for past ten years at Perth Amboy plant, Roessler & Hasslacher Chemical Co., is transferred to the Niagara Falls plant.

E. B. Sanigar, University of Sheffield, Eng., is awarded Edward Weston fellowship in electrochemistry by the American Chemical Society.

Sir James C. Irvine is awarded Elliott Cresson gold medal by the Franklin Institute in recognition of his research in the field of Carbohydrate chemistry.

Matthew J. Carney, vice-president, Union Carbide & Carbon Corp., is elected a director of the corporation.

George Eastman, Eastman Kodak Co., agrees to build and equip a dental dispensary in Rome, Italy, at a cost of $1,000,000.

R. H. Horsburgh, formerly treasurer, is elected vice-president, Glidden Co.

James F. Roddy, Western manager, Dearborn Chemical Co., Chicago, for sixteen years, dies in Denver, August 18, aged 73.

Harry C. Osborne, former treasurer, National Industrial Alcohol Co., dies at his home in New Orleans, August 11, aged 63.

Salesmen's Association Names Williams as Next President

Salesmen's Association, American Chemical Industry, nominates following officers for coming year: president, Victor E. Williams, Monsanto Chemical Works; vice-presidents, Fred A. Koch, Dow Chemical Co., Ira Vandewater, R. W. Greeff & Co., and H. F. Wilmot, A. Kilpstein & Co.; secretary-treasurer, B. J. Gogarty, American Solvents & Chemical Co. The following are new members of the executive committee: George Bode, Roessler & Hasslacher Chemical Co. and A. L. Benkert, Noil Chemical & Color Co.

Burnell R. Tunison

Burnell R. Tunison, vice-president and director, American Solvents & Chemical Corp., New York, dies August 8, aged 37. He was born in San Francisco, December 13, 1892, and was a graduate of the University of Southern California, obtaining a master's degree in chemical engineering in 1916. After some years spent in research in petroleum refining, he went with the U. S. Industrial Alcohol Co. in June 1918. He was associated with that company until May 1, 1926, when, upon the organization of the American Solvents & Chemical Corp., he became associated with the latter as a vice-president and director.

He was a thirty-second degree Mason and a Shriner, and a member of the Society of Automotive Engineers, the American Institute of Chemical Engineers, and the Chemists' Club, New York.

John M. Zurn, president, O. F. Zurn Co., Philadelphia, textile oils, dies August 11, aged 63. He had been president of the company since its incorporation in 1893. He was also founder of the Quaker City Chemical Co. of Philadelphia and Knoxville, Tenn., and treasurer of the Quaker City Chemical Co. of Canada, Ltd., Hamilton, Ont.

Robert Kunze, a director and co-manager of the New York office of N. V. Potash Export My., dies in Bad Reichenhall, Germany, July 30, aged 58. He was born at Leipzig, August 31, 1871 and had been associated with the German Potash Syndicate since the late nineties when he started as an assistant manager. He became a director of the potash syndicate in 1920.

Sophie Schaller Herty, wife of Dr. Charles H. Herty, Chemical Foundation, dies August 19 at Hampton Bays, L. I. She was a native of Athens, Ga., daughter of Col. Frank Schaller, and was educated at the Home School for Girls, Athens. Her marriage took place December 23, 1895.

Henry S. Loud, general superintendent, Atmospheric Nitrogen Corp., Solvay, N. Y., dies in Syracuse, August 16, aged 60. He had been associated with the company since 1921, having previously been an engineer and executive with several companies. He was a graduate of Stevens Institute.

Edward Dwight Kendall, former chemical consultant, dies at Elizabeth, N. J., July 29, aged 99.

Frederick Jaeger, Baltimore chemist, dies at South Weymouth, Mass., July 28, aged 51.

Frank Sammet, chief chemist, Crane & Co., Dalton, Mass., dies August 1, aged 48.

Dr. James R. Eckman, research chemist, Bureau of Standards, and authority on gases in metals, dies at Leechburg, Pa., August 2.

R. L. Ivey, vice-president, Consolidated Naval Stores Co., Jacksonville, dies July 30.

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Phenol U. S. P.

Benzol

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Magnesium Carbonate

Magnesium Oxide

Quinine Bisulphate

News of the Companies

Roessler & Hasslacher Chemical Co. holds annual outing at Niagara Falls, August 10. Nearly 2,500 employees of the company attended on this occasion which was featured by the presentation of gold medals to the following who have been in the company's employ for twenty-five years or more: A. P. Archer, John B. Barrington, James Cameron, William F. Flaherty, D. A. Hollinger, Peter Hay, Richard Felvua, and Beckwith Myers.

International Combustion Tar & Chemical Corp. announces election of following officers: chairman of the board, George E. Learnard, succeeding F. J. Lewis; president, Dr. Walter Runge, succeeding W. H. Lewis; and vice-president in charge of sales, Grant Thorn, F. J. Lewis continues as a director of the parent organization, International Combustion Engineering Corp., while W. H. Lewis is associated with the corporation in an advisory capacity.

American Solvents & Chemical Corp. publishes a 64-page indexed and illustrated booklet entitled, "AMER-SOL Formula Book," containing useful information concerning alcohol formulas and production. Copies may be obtained upon request to the company.

Khimstroy (the Soviet Chemical Plant-Construction Corp.) sends representatives to this country in connection with technical assistance contracts with E. I. du Pont de Nemours & Co., Inc., and the Nitrogen Engineering Corp.

Duval Texas Sulphur Co. is reported producing about 500 tons of sulfur per day from its 2,000 acres of leased land in Duval county, Texas. It is estimated that this acreage will yield about 3,750,000 tons.

Grasselli Chemical Co. publishes well-illustrated booklet entitled, "Looking Ahead Twenty Years in Wood Utility," describing the place of zinc chloride as a standard salt wood preservative.

Merck & Co., Inc., publishes new price list in the form of a loose leaf binder to which additions may conveniently be made from time to time as they become necessary.

Monsanto Chemical Works publishes booklet entitled, "Monsanto, Illinois," which describes the company's industrial developments at that location.

Standard Textile Products Corp. purchases Cotex Corp., Newark, manufacturers of imitation leather and rubber cloth.

Chemical Solvents, Inc., New York, announces removal to new quarters at 110 East st. 42 Telephone Caledonia 4623.

Bishopric & Lent Co.'s salt works, near Expanse, Saskatchewan, are destroyed by fire with estimated damage of $500,000.

Mechling Bros., Medford, Mass. plant is damaged by fire August 21 with estimated loss of $25,000.

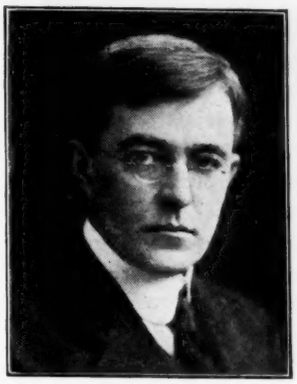
Heyden Chemical Corp. announces removal of New York offices to larger quarters at 50 Union sq.

Canada Gypsum & Alabastine Co. acquires Standard Lime Co. Joliette and St. Mark, Quebec.

R. W. Greeff & Co., New York, announces removal to new quarters at 10 East 40 st.

American Chemical Society Holds Seventy-Eighth Meeting

American Chemical Society holds seventy-eighth meeting at Minneapolis, September 9 to 13. Dr. Irving Langmuir, president of the society, delivered his address at a general meeting in the Nicollet Hotel, September 11, on "Modern Concepts in Physics and their Relation to Chemistry." At that time also, he made the Priestly Medal award to Francis P. Garvan, for distinguished services to chemistry and Dr. Garvan made an address on "Random Thoughts of a Lay Chemist."



Dr. Irving Langmuir

The five-day session opens with registration, council meetings, and a reception at the hotel on September 9. Two general meetings on September 10 open the work of the session. The first, under the auspices of the Divisions of Physical and Inorganic Chemistry, Hugh S. Taylor, chairman, is a symposium on "Chemical Activation by Light and by Ionizing Agents." Speakers are M. Bodenstein, H. S. Taylor and D. G. Hill, W. A. Noyes, Jr., K. F. Bonhoeffer, and Francis Perrin. The second, under the auspices of the Division of Agricultural and Food Chemistry, C. H. Bailey, chairman, is a symposium on "Flour and Bread Production." Speakers are M. J. Blish, R. C. Sherwood, C. O. Swanson, C. G. Harrel, A. A. Schael, A. F. Walde, C. E. Mangels, E. Toepfer, P. W. Boutwell, C. S. Boruff, A. M. Bushwell, W. H. Peterson, H. A. Schuette, F. N. Taylor, F. B. LaForge and L. E. Smith.

A symposium on "Dairy Chemistry", H. H. Sommer, chairman, takes place September 11. Speakers are L. S. Palmer, E. O. Whittier, J. H. Nair, F. E. Rice, G. E. Holm, A. Leighton, F. P. Nabenhauser, and R. W. Bell. The remainder of the session is given over to the various divisional meetings and the entertainment program, which in addition to the dinner on Monday night, and the presidential address on Wednesday night, consists of a smoker and entertainment on Tuesday night, and various tours to industrial plants and other places of interest on Thursday afternoon and Friday.

Combustion Engineering Corp. announces establishment of Boston office at 100 Arlington st. with following personnel: district manager, J. J. Brady; sales engineer, M. E. Yeager; and merchandise salesman, S. J. Harris.

"Graesser-Monsanto Chemical Works, Ltd.,—A Stirring Achievement," is the title of an article in the August issue of *"Anglo-American Trade,"* London. It describes the history and development of the Monsanto organization.

U. S. Steel Corp. plans to buy from 80,000 to 150,000 tons of manganese annually from the Georgian Manganese Trust during the next five years.

Wilson & Bennett Manufacturing Co., steel containers, moves New York offices to new quarters at 39 Courtlandt st.

Raymond Bros. Impact Pulverizer Co. issues folder describing performance records of the "Raymond Kiln-Mill."

Sharples Specialty Co., Philadelphia, publishes booklet describing operations of "Sharples Horizontal Centrifugal."

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The trade was quick to recognize the excellence of Mallinckrodt chemicals and the integrity of their makers. A reputation was built that has endured and grown brighter through these many years. To-day the Mallinckrodt Laboratories are one of the largest manufacturers of fine chemicals in the United States . . . a distinction that we share with the many friends who helped to make it so.

While our products and customers have increased many fold, that personal touch which guided the Spirit of Service is never lacking and we invite you to call upon us at any time. We will not disappoint you.

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Dibutyl Tartrate
Triacetine

Special Solvents and Plasticizers

KESSLER CHEMICAL CORPORATION
ORANGE, N. J.

Department of Commerce Agents Conclude Paris Conference

Government representatives in the foreign service handling chemical matters conclude their conference in Paris, August 5, after inaugurating plans for co-ordinating reports from the various European offices and for promoting chemical exports. American business men, representing twelve different branches of the chemical industry, sales promotion, scientific research, advertising and finance, attended the conference in addition to the foreign representatives of the Department of Commerce. The conference was held under the direction of Charles C. Concannon, chief, Chemical Division, Bureau of Foreign and Domestic Commerce. For several years annual meetings have been held of the commercial representatives of the United States in Europe and at the last meeting it was suggested that the men who specialize in commodities might hold supplementary meetings. It is probable that if the gathering of the chemical men has a favorable result annual meetings of specialists of the various other fields may be held. This meeting of the chemical specialists was in the nature of an experiment in an effort to obtain information of importance to American industry and business.

The conference brought out the necessity of reporting chemical matters from the point of view of Europe as a whole rather than from that of separate countries, as it was stressed that the world's chemical industry is divided into two groups, American and European, and that it is necessary to view the industry on each side of the Atlantic much as a unit. Co-ordination of the foreign officers' efforts so as to furnish a better composite picture of European conditions is expected to follow the conference.

More attention will be paid to actual trade promotion as a result of the conference, it is expected, as one of the principal topics of discussion was the growth of co-operation and sales agreements among European nations and ways for American firms to secure a proper share of the European markets

Discussion of the competition offered by European chemical cartels in the markets of the world brought out expressions of a belief that American manufacturers were meeting the situation through mergers. This method was declared to have advantages for the participating concerns in that they do not sacrifice their individuality.

Newport Co. Loses Effort to Register Trademark

Newport Company, South Milwaukee, Wis., loses in effort to secure registration of the word, "Newport,"on an irregular background as a trademark for coaltar dyes.

On appeal, M. J. Moore, Assistant Commissioner of the Patent Office, has affirmed refusal of registration of the mark unless accompanied by a disclaimer of the geographical name, "Newport." The company refused to make this disclaimer, holding that the word is not geographical when used in connection with the design, but the assistant commissioner ruled that "Newport" is the dominant characteristic of the mark and that in the minds of most people this means one of several towns in the United States. Since a competitor in any of these places would have the right to use this word, he ruled that it could not be registered.

Textile Color Card Association issues 1929 Fall Season Hosiery Color Card.

United Africa, Ltd., announces removal of offices to 205 East 42st., New York.

Imperial Chemical Industries, Ltd., suffers damage to extent of several thousand pounds by a fire at its Thornton works.

Spencer Kellogg & Sons purchases business and property of Copra Milling Co., New York, coconut oil producers.

Carbide & Carbon Produces Alcohol From Ethylene Gas

Carbide & Carbon Chemicals Corp. manufactures 48,000 proof gallons of ethyl alcohol synthetically under a temporary permit issued by the Bureau of Prohibition, according to a letter written by Dr. James M. Doran, Commissioner of Prohibition, to Senator Watson (Rep.) of Indiana, majority leader of the Senate.

The information regarding production of synthetic alcohol from the basic sources of petroleum and coal was supplied to Senator Watson at his request, in a letter seeking to determine the possibilities of establishing on a commercial basis the production of alcohol from non-agricultural materials. The majority leader is a member of the Senate Committee on Finance, which has had under consideration tariff rates for blackstrap molasses, present alcohol raw material. Practically all the blackstrap molasses used in the United States for manufacturing alcohol is imported from Cuba.

Following is the text of the letter from the Commissioner of Prohibition to Senator Watson:

My dear Senator: Replying to your letter inquiring about the manufacture of ordinary ethyl alcohol, commonly known as grain alcohol, from gases and petroleum and materials other than grains and molasses.

There has been some public discussion of the so-called synthetic manufacture of ethyl alcohol and the present situation in that respect is quite interesting. The Carbide & Carbon Chemicals, Corp., were given a temporary permit for the experimental production of synthetic alcohol on a commercial scale at their plant in South Charleston. The basis of the production is the conversion of ethylene gas to ethyl alcohol and the subsequent purification of the ethyl alcohol. There are a number of sources of ethylene, of which petroleum and gases from coke ovens are the most important.

Under this temporary permit the company produced approximately 48,000 proof gallons of ethyl alcohol, synthetically, which was denatured and used in the regular chemical processes of the company. There is no reason why the alcohol thus produced could not be used for any nonbeverage purpose, as it is the identical chemical compound produced by ordinary fermentation methods from grains and molasses. It is my understanding that the results of the run were satisfactory.

The manufacture of alcohol in this manner is only limited by the supply of petroleum and coal, as it is apparent that the manufacturing problem has been solved.

Canadian Gas & Equipment, Ltd., capitalized at $350,000, is organized to manufacture acetylene, oxygen, hydrogen, nitrogen, neon, helium, and other rare gases, and the equipment and supplies necessary for their use. The new company will take over the acetylene and oxygen plants of the present Gas & Equipment Co., Ltd., of Toronto and Montreal, and will also acquire the oxygen-hydrogen gas plants of Harris Abattoir, Ltd., Toronto.

United Molasses Co., London, in view of its large interests in the United States and Cuba, form an American board of directors consisting of Maurice Levin, chairman of Dunbar Molasses Corp. as chairman; Arthur W. Loasby, president, Equitable Trust Co.; C. U. Snyder, chairman, C. U. Snyder Co. and F. A. Rogers, president, Eastern Alcohol Corp.

Dyestuffs department, E. I. du Pont de Nemours & Co., Inc., announces addition of Sulfogene Golden Brown CF to its line of sulfur colors.

Davison Chemical Co. acquires controlling interest in Fremont Cotton Oil Co., Goldsboro, N. C.

Roessler & Hasslacher Chemical Co. occupies booths 19 and 20 at the National Metal Exposition, Cleveland, September 9-13.

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KUTTROFF-PICKHARDT & CO., Inc.
1150 Broadway, New York, N. Y.

The Pennsylvania Salt Manufacturing Company

of Philadelphia

announces the purchase of the process and plant for the manufacture of

Ammonium Persulphate

formerly owned by
The North American Chemical Company,
Bay City, Michigan

This equipment has been transferred to their Wyandotte, Michigan plant, and is now being operated in charge of the people formerly at Bay City.

THE PENNSYLVANIA SALT MANUFACTURING COMPANY

solicits orders through its regular representatives

Ansbacher-Siegel Corp. Formed in Merger of Dry Color Companies

Ansbacher-Siegel Corp. is to be formed by merger of G. Siegel Corp. of America and Ansbacher Corp. The former is engaged only in the manufacture of fine colors, while the latter is not only a manufacturer of dry color but also a large producer of agricultural insecticides.

The plan for the merger will be submitted to the stockholders at special meetings on Sept. 16. The new corporation, will have two classes of voting stock, 15,000 shares of convertible preference stock and 40,000 shares of common stock. Preference stock will be entitled to dividends of $2.40 a share and, in liquidation, to $40 a share. It will be convertible share for share into common stock.

The shares of the merging companies will be exchanged for stock in the new corporation on terms which will preserve the present relative positions of the two companies.

Container Service Desirable Says Interstate Commerce Commission

So-called railroad "container service" as now operated and as proposed to be extended in the eastern territory is desirable in the public interest, according to a proposed report to the Interstate Commerce Commission which recommends that the Commission reach such a decision.

The rate structure now applicable to such service is wrong in principle and unlawful, the proposed report, filed by Examiner Harry C. Ames, states. Present conditions, in the opinion of Examiner Ames, do not warrant the establishment in western territory of the service at this time.

The examiner's recommendations followed an exhaustive investigation into the entire container situation throughout the United States, and is considered in transportation circles to be a far step toward greater efficiency in the handling of less-than-carload freight.

Government Helium Production Increasing at Amarillo Plant

Helium produced during July by government plant near Amarillo, Texas, totaled 648,850 cubic feet at an average purity of 97 per cent. Production has been increasing steadily and when second unit is completed, any desired amount up to 20,000,000 cubic feet per year may be produced. It is believed that production costs will be well within previous estimate of $20 per 1,000 cubic feet which is lowest figure at which helium has ever been produced, according to the Bureau of Mines. Average cost of helium produced at Fort Worth during 1926 was $34 per 1,000 cubic feet.

Link Belt Co. reports for six months ended June 30, 1929, surplus of $1,385,932 after federal taxes and preferred dividend requirements, equivalent to $1.95 a share on 709,177 no-par shares of common stock. Balance sheet as of June 30, 1929, shows current assets of $15,169,656 and current liabilities of $1,383,565.

I. G. Farbenindustrie acquires a 76 per cent interest in the Behringwerke A. G., Warburg, Germany, which specializes in the production of serums and other biological and pharmaceutical products.

C. O. Bartlett & Snow Co., Cleveland, publishes a new bulletin, No. 64, entitled "Solvent Extraction of Oils and Greases." Copies may be secured upon application to the company.

U. S. Freight Co. plans extension of freight container service as far West as St. Louis and from the Canadian border to the Potomac and Ohio rivers.

American Commercial Alcohol Acquires Kessler Chemical

Kessler Chemical Corp. is organized as a subsidiary by the American Commercial Alcohol Corp., to acquire the business and assets of the Kessler Chemical Co., Orange, N. J. Dr. J. M. Kessler is president, and Dr. O. B. Helfrich, vice-president of the new organization, and Dr. Kessler becomes a vice-president of the parent organizations. No change in personnel is contemplated.

The products of the Kessler Chemical Corp., consisting of industrial chemicals, solvents and plasticizers for the lacquer and kindred industries, will be distributed through its own sales organization and through that of the American Commercial Alcohol Corp.

The acquisition of the Kessler Co. it is believed, will effect better service by making possible co-operation in research and engineering and advantages in the procurement and use of raw materials. The Kessler company was established in 1921 by John M. Kessler, Ph.D., who for ten years was chief of the chemical research division of celluloid and lacquer production of E. I. du Pont de Nemours & Co., Oregon B. Helfrich, Ph.D., later became associated with Dr. Kessler.

Therm-o-Proof Insulation Co. Makes Mineral Wool From Lead

Therm-O-Proof Insulation Co., Chicago, works out process for making mineral wool from lead slag. This mineral wool, which is being put upon the market under the trade name of Therm-O-Proof, is a fluffy and light substance that will not burn or melt at less than 2,500 degrees Fahrenheit, and is being used for insulating material. Only plant manufacturing this wool at present on a commercial scale is at Alton, Ill., where it is being operated on slag obtained from the lead refinery plant of American Smelting & Refining Co. Approximately 50 tons of this material is now being turned out daily in Alton and very soon this output will be increased. It will be marketed in four forms: loose wool, in blanket form, in board and bricks. Principal uses are in building insulation, high and low temperature insulation, sound deadening or accoustics and fireproofing.

New Incorporations

Atlas Process Co., North Wildwood, manufacture chemicals—Palmer M. Way, Wildwood—$125,000.

Canadian Torpedo Co. Ltd., Calgary Alberts, explosives—$150,000. Patrick A. Trapp, Charles A. Walters, George Huntinger.

The Canada Carbon Black Company, Ltd., Toronto, Ont.—40,000 sh com. no par shares, Joseph M. Bullen, Harold L. Steele, William F. Woodliffe.

Eucozone Sales Corp., 44 Wall Street, chemicals—Campbell, Harding & Goodwin—$50,000 pf, 2,000 sh com.

International Carbonic Engineering Company, Philadelphia, Pa., carbonic acid—Philip L. Garrett, Wilmington, Del.—$500,000, 25,000 sh com.

Elaterite Manufacturing Corp., New York, N. Y., paints, enamels, lacquer—United States Corporation Company—2,000 sh com.

Silkeze Corp., Wilmington, Del., chemicals—Corporation Trust Co. of America—40,000 sh com.

Sun Chemical & Colo Co., Inc., Brooklyn, N. Y., ink makers—Corporation Trust Co. of American, Wilmington, Del.—100 sh com.

Neidich Cel-Lus-Tra Corp., Ventnor, manufacture and deal in rayon United States Corporation Company—$250,000 pf, 20,000 sh com.

Goedrich Chemical Company, Wilmington, Del.—Corp. Trust Co. of Amer.—3,000 sh com.

Mundo Products, chemicals—Briesen & Schrank, 50 Church St.—2,500 sh com.

Carbo Frost, Inc., Wilmington, Del., carbon dioxide in various forms—Corporation Service Company—1,000,000 sh com.

Industrial Sanitary Wipe-Cloth Supply Co., disinfectants—Bergman & Cole, 15 William St.—20,000 sh.

Marine Laboratories, Inc., Jersey City, chemicals—Robert F. Rosborne, New York City—125,000 sh.

Birney Stores Co., Camden, Manufacture chemicals—Charles C Cotton, Camden—125,000 sh.

United States Electro-Chemical Corp.—F. Silver, 28 West 44th St.—300,000 sh.

Kobbe Chemical Corp.—H. J. MacLachlan, 75 East 45th St.—150 sh com.

Kobbe Laboratories, chemicals—H. J. MacLachlan, 75 East 45th St.—20,000.

Neidich Viscose Corp., Dover, Del., art silks—U. S. Corp. Co.—$1,000,000, 250,000 sh com.

Harold Chemical Co., Inc., Wilmington, Del. Securities—Corp. Service Co.—175,000.

Aberlyons Laboratories, chemicals—J. Machlowitz, 191 Joralemon St., Brooklyn—1,000 shs com.

Crookes Laboratories, chemicals—Hollander & Bernheimer, 61 Broadway—500,000 shs.

Pennsylvania Chemical and Oil Co. Inc., Camden Corporation Guarantee and Trust Company, Camden—2,500 shs com.

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The Financial Markets

Solvay Investment Corp. Makes $25,000,000 Stock Offering

New Preferred Stock at $100 Per Share Bears Warrants For Purchase at $325 a Share of One Share of Allied Common For Every Four Shares Held—Solvay & Co. of Belgium Organized This Holding Company.

Solvay Investment Corp.'s 5½ per cent cumulative preferred stock, bearing warrants for the purchase at any time on or before September 1, 1934, at $325 per share of one share of Allied Chemical & Dye Corp. common stock for every four shares of this preferred, is offered publicly at $100 per share to the extent of $25,000,000.

This company was organized under the laws of Delaware in 1927 by Solvay & Co., of Belgium, to acquire, hold and sell securities of any character. Solvay & Co. own all the common stock. Upon completion of the present financing the corporation will own 466,488 shares of Allied Chemical & Dye no-par common stock, of which 62,500 will be deposited in escrow against the exercise of warrants attached to the new preferred stock. The purpose of this issue is to purchase this Allied Chemical & Dye stock. The total assets of the company have a market value at present quotations of $140,000,000. Net earnings of the company for 13 months ending March 31, 1928, were $2,238,597, and the earnings for the fiscal year ending March 31, 1929, were $2,804,350. The annual requirement for dividends on this preferred stock is $1,375,000.

Newport Co. Offers Rights to Stockholders in Ratio of 40 to 1

Newport Co. offers common stockholders rights in ratio of one share at $20 to every 40 shares held August 24. Rights expire September 16.

The company declared initial quarterly dividend of 50 cents on the common, placing stock on $2 annual basis, and regular quarterly dividend of 75 cents on Class A convertible stock, both payable September 3 to stock of record August 24.

Newport Co. and subsidiaries, report for quarter ended June 30, 1929, net profit of $375,687 after interest, depreciation and federal taxes, equivalent after dividend requirements on $3 Class A stock, to $1.09 a share on 251,250 no-par shares of common stock, comparing with $355,930 or $.01 a share in preceding quarter.

For six months ended June net profit totaled $731,617 after above charges, equal to $2.10 a share on common.

Monsanto Chemical Works Net 47 Per Cent Higher Than 1928

Net earnings of Monsanto Chemical Works for the six months ending June 30, 1929, amounted, after all charges and taxes, to $644,225.51, being an increase of $206,973.60, or at the rate of 47 per cent over the corresponding period in 1928.

These figures do not include any part of the earnings of The Rubber Service Laboratories Co., all of the stock of which company was acquired in July 1929.

Eastman Kodak Co. offers stockholders of record August 30 rights on the basis of one share of common stock at $150 to every 10 shares held.

American Solvents Simplifying Capital Structure for Expansion

American Solvents & Chemical Corp. approves plan for simplifying capital structure. Readjustment was deemed desirable to carry out a program of expansion through absorption of companies in the chemical field.

Under the terms of the plan, present preference stockholders will receive one share of new $3 convertible preference and 1-5 share of common stock plus 1-10 share additional of preference in payment of dividend arrears. Common stockholders will receive new common stock on a share for share basis. All dividend arrears on the preference stock are paid off through the consummation of the plan.

Pro-forma balance sheet as of June 30, after giving effect to consummation of readjustment plan, shows current assets in excess of $1,900,000, with current liabilities less than $425,000, or a ratio of more than 4½ to 1.

Du Pont De Nemours Declares Regular Quarterly Dividend

E. I. du Pont de Nemours & Co. declares regular quarterly dividends of $1 on common, payable September 14 to stock of record August 28, and $1.50 on debenture stock, payable October 25 to stock of record October 10. Last quarter an extra dividend of 50 cents was paid on common, in addition to the regular quarterly dividend.

Three members were added to the executive committee. They are J. Tompson Brown, general manager of the explosive department, Jasper E. Crane, chairman of the board of du Pont Ammonia Corp., and Willis F. Harrington, general manager of the dyestuffs department. At the meeting of the directors last month these three were elected vice presidents.

Clorox Chemical Co. Reports Net of $463,146 For Year

Clorox Chemical Co., San Francisco, reports net profit for year ended June 30, 1929, of $463,146 after depreciation and federal tax, equal to $4.07 a share on 55,000 no-par shares of Class A and 58,800 shares of Class B stock. After regular dividend of $1.50 a share on both A and B stocks, balance to surplus was $292,446. Statement says "aggressive expansion policy is to be pursued during the present fiscal year. To date trade connections have been established for development of new territory during the fiscal year of 1929-1930 which approximate an expansion of 35 per cent over the year just ended. National distribution is the objective for the fiscal year 1929-1930." The report is first complete annual pamphlet statement issued by present company.

Drug, Inc., acquires Bristol-Myers Co., Bristol-Myers stockholders will receive 1⅛ shares of Drug, Inc., for each share of Bristol-Myers and will also receive a cash dividend of $5 a share. They will also receive a cash dividend of 83⅓ cents a share covering the two months during September 1 at the rate of $1.25 a share quarterly.

Air Reduction Corp. now holds an interest in the U. S. Industrial Alcohol Corp. consisting of about 50,000 shares carried on the books at $4,406,192, the market value of which is about $9,000,000.

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CLEVELAND, OHIO.

L'Air Liquide Capital Stock Introduced into This Country

L'Air Liquide capital stock is introduced into this country for the first time in the form of Guaranty Trust Co. depository receipts. Application has been made to list it on the New York Curb.

L'Air Liquide was incorporated in 1902 to acquire and develop the inventions of George Claude for the liquefaction of air, the production of gases from the air and the production of synthetic ammonia. It owns and operates some forty-four plants in France, ten in Canada, eight in Belgium, two in Sweden, eight in North Africa, eight in Japan and Korea and three in Egypt. In addition, it owns a controlling interest in the Canadian Liquid Air Co., Ltd.; Auto Lite Gas Co., Ltd., a Canadian concern; Societa Italiana Ossigeno ed Altri Gas and Sociedad Espanola Oxigeno. It is affiliated with the Air Reduction Co., Inc., in the United States. It is reported that E. I. du Pont de Nemours & Co., Inc., has recently acquired a holding of shares in L'Air Liquide.

L'Air Liquide concludes agreement with Hungarian firm, Vulkan, by which, with the financial help of the French concern, the capital of the Hungarian company is to be increased and new factories for the production of oxygen, acetylene and carbon dioxide are to be erected.

International Printing Ink Half-Year Net at $1,171,043

International Printing Ink Corp. for six months ended June 30, 1929, reports consolidated net profit of $1,171,043 after interest and taxes, equivalent after dividend requirements on 6% preferred stock, to $3.54 a share on 271,158 no par shares of common stock. This compares with $870,779, or $2.58 a share on 256,002 shares of common in first half of 1928. Consolidated sales for the six months totaled $10,313,088 against $9,137,992.

Consolidated balance sheet of International Printing Ink Corp., as of June 30, 1929, shows current assets of $9,438,091 and current liabilities $1,575,941. Cash and call loans amounted to $1,210,152.

National Distillers Products Corp. and subsidiaries report for quarter ended June 30, 1929, profit of $88,666 after interest and depreciation, but before federal taxes, comparing with $232,279 in preceding quarter and $152,692 in June quarter of 1928. Profits for first six months of 1929, totaled $320,945 before federal taxes against $61,175 in first half of previous year.

International Salt Co. declares a quarterly dividend of $1.50, payable October 1 to stock of record September 16. Last quarter a similar dividend was paid. Dividends were omitted for four quarters preceding.

International Agricultural Corp. declared regular quarterly dividend of $1.75 on prior preference stock payable September 3 to stock of record August 15.

I. G. Farbenindustrie's holding corporation, Basel Holding Co., issues stock in Switzerland amounting to 270,000,000 francs of which 98,000,000 francs have been paid in.

Tennessee Copper & Chemical Corp. declares regular quarterly dividend of 25 cents a share, payable September 16 to stock of record August 31.

Union Carbide & Carbon Corp. declares the regular quarterly dividend of 65 cents, payable October 1 to stock of record September 6.

Commercial Solvents Corp. declares regular quarterly dividend of $2, payable October 1 to stock of record September 13.

American Cyanamid Increases Common and Calls Preferred

American Cyanamid Co. increases authorized Class B common stock to 3,000,000 shares from 700,000 and extends offer to preferred stockholders to exchange two class B common shares for each preferred share to September 30 from the previous date of September 1. Following this offer, the company called the remaining shares of preferred stock at 120 as of October 1.

The present outstanding Class B common stock, par value $20, amounts to $14,000,000, and the new issue, will more than quadruple the number of shares now authorized.

Negotiations are said to be under way for the acquisition of nine or ten companies in the allied lines by American Cyanamid Co., in pursuance of a policy to make the company practically a self-contained unit for the manufacture and distribution of mining and industrial chemicals.

American Commercial Alcohol Reports $228,968 Quarter Surplus

American Commercial Alcohol Corp. and subsidiaries report for quarter ended June 30, 1929, surplus of $228,968 after all charges and preferred dividends, available for the common stock, equivalent to 76 cents a share earned on 300,229 no-par shares of common stock. This compares with $123,009 available for the common stock from April 25, 1928, when the company was organized, to June 30, 1928. For the six months ended on June 30, net earnings were $493,083, equal to $1.64 a share of common stock.

U. S. Gypsum Co. Reports Six Months' Net of $2,329,244

United States Gypsum Co. and subsidiaries report for six months ended June 30, 1929, net income of $2,329,244 after depreciation, federal taxes, etc., equivalent after 7% preferred dividend requirements, to $2.70 a share (par $20) earned on 765,027 shares of common stock. This compares with $3,334,487 or $4.42 a share on 691,502 common shares in first half of 1928. Consolidated balance sheet as of June 30, 1929, shows current assets of $15,545,294 and current liabilities of $4,016,596, comparing with $16,988,603 and $2,230,184, respectively, on June 30, 1928. Profit and loss surplus amounted to $28,832,153 against $26,774,030.

Standard Chemical Co., Toronto, reports that sales for the year ended March 31, 1928, were increased by $419,300 to a total of $2,200,543 for the year ended last March 31, according to Mr. Davies. Net profits increased by $69,400, to $209,067, equivalent to $5.60 on each of the 37,277 shares outstanding of no par value.

Texas Gulf Sulphur Co. declares regular quarterly dividend of $1, payable September 16 to stock of record September 2. The company states stockholders will be advised later as to what portion of this distribution is from free surplus and what from reserve for depletion.

Vanadium Corp. of America reports for six months ended June 30, 1929, net income of $1,177,688 after depreciation, depletion, federal taxes, etc. equivalent to $3.12 a share earned on 376,637 shares of no-par stock. This compares with $969,492 or $2.57 a share in first half of 1928.

Canada Gypsum & Alabastine, Ltd., approves proposal of directors to split the authorized common stock four-for-one. Authorized capitalization is 500,000 common shares.

The Industry's Stocks

1929 Aug. 29 High	1929 Aug. 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Aug.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
								NEW YORK STOCK EXCHANGE					
216¾	210	216¾	95½	99¾	59	82,400	714,700	Air Reduction	No	683,873	$2.00	9 mo. 3.70	10.74
347	347	349	241	252¾	146	73,300	580,900	Allied Chem. & Dye	No	2,178,109	6.00		10.03
121½	121½	125	120½			10,000	26,900	7% pfd	100	392,849	7%		62.59
12½	11⅜	23⅜	10½	26	15¾	8,500	115,000	Am. Agricultural Chem	100	333,221	...		1.59
47	43½	73¾	40⅜	79⅞	55⅜	4,800	32,500	pfd	100	284,552	...		7.86
177¼	173⅜	184½	107¾	117⅛	70¼	1,113,800	2,411,300	American Can	25	2,473,998	3.00		4.11
...	...	142	136½	147	136¾	3,700	30,400	pfd	100	412,333	7%		31.66
51⅜	48¾	55	42½	87⅞	74	31,400	124,000	Amer. Com. Alc	No	77,000	...	3 mo. 2.66	...
72½	70½	81⅞	50	63¾	39	263,400	1,561,900	American Metal, Ltd	No	595,114	*3.00	9 mo. 2.30	3.64
126	126	135	113⅜	117½	109	4,400	27,300	pfd	100	99,907	6%	9 mo. 18.92	50.27
121⅛	120	124¾	93½	293	169	314,400	2,799,800	American Smelt. & Refin	100	609,980	4.00	6 mo. 10.61	19.64
134	134	138	130	142	131	1,700	24,300	pfd	100	500,000	7%	6 mo. 16.44	30.96
28	26½	49½	22½	57	6⅜	54,800	563,600	Amer. Zinc & Lead	25	193,120	...		...
107	105⅜	111¼	90½	117⅞	40	21,400	59,700	pfd	25	96,560	...		d2.72
126⅜	124⅛	140	99	120½	53½	3,347,100	22,475,700	Anaconda Copper Mining	50	3,302,817	6.00		3.37
35½	35	49½	29	112⅞	55½	41,200	359,700	Archer Dan. Mid	No	213,712	4.00	7.34	5.77
...	...	95	84⅞				2,120	pfd	100	43,000	7%	6.94	37.39
114	104½	115	90	114	63	10,100	106,500	Atlas Powder Co	No	261,438	4.00	6.30	5.75
...	...	106½	98½	110½	102	550	4,410	pfd	100	90,000	6%	6 mo. 10.83	22.71
67½	66½	77⅞	53½	66½	50	422,600	5,333,800	Atlantic Refining	25	500,000	1.00	9 mo. 21.72	1.83
4	4	9½	3⅜	12½	4½	28,500	299,500	Butte Copper & Zinc	5	600,000	...		0.10
...	...	12½	6½	16⅜	8½	5,600	133,800	Butte Superior Mng	10	290,198	2.00	9 mo. 0.16	0.94
32⅞	32½	37⅜	31⅛	122	65	25,800	202,800	By Product Coke	No	189,936	*5.00	9 mo. 5.78	5.68
1½	1½	4	1½	5⅜	1⅜	8,800	206,300	Calla Lead & Zinc	10	724,592	...	9 mo. ...	0.10
47	46½	61⅞	36⅜	47⅜	20½	130,500	2,052,100	Calumet & Hecla	25	2,005,502	2.50	9 mo. 0.95	0.29
28⅛	28⅛	32	16½	119	61½	53,800	248,200	Certainteed Prod	No	400,000	...	9 mo. ...	5.31
...	...	81½	47½	63½	23½	300	8,700	7% pfd	100	62,904	7%	9 mo. 0.87	56.80
...	...	127½	71¼	74⅞	37⅜		1,331,400	Chile Copper	25	4,415,497	3.00	6 mo. 1.96	2.51
227½	220	227¼	121½	134½	79	33,400	492,100	Columb Carbon	No	402,131	...	9 mo. 5.24	4.83
...	...	504	225½	250½	137½	302,00	397,200	Commercial Solvents	No	217,722	8.00	13.19	9.25
88⅛	84	88⅛	60	64½	53	391,800	2,740,100	Cont. Can	No	1,420,000	5.00		7.21
124⅛	124⅛	126	124¼	128	123		2,280	pfd	100	51,125	7%		86.82
109¼	108	111½	82	94	64⅜	129,800	1,242,400	Corn Products	25	2,530,000	2.00	9 mo. 3.00	3.50
...	...	144½	139⅜	146⅜	138½	15,500	25,030	pfd	100	250,000	7%	9 mo. 35.63	42.40
48½	47⅛	69½	42⅞	68⅛	34⅛	59,400	1,097,300	Davison Chem	No	480,000	...		6.21
45½	45½	64⅞	43½	61	40	9,700	149,400	Devoe & Rayn A	No	110,000	2.40	6 mo. †5.95	†5.03
...	...	115½	112	120	108	260	2,100	1st pfd	100	17,473	7%	6 mo. 34.71	53.23
...	...	119	112	121½	114	8,100	44,200	Dupont deb	100	904,539	6%	9 mo. 57.79	57.03
214½	212	222	155¾	503	310	202,100	957,300	Dupont de Nemours	No	2,661,658	*14.75	20.89	15.45
225	223	227⅜	168	194½	163	88,900	314,200	Eastman Kodak	No	2,057,560	*8.00		9.61
...	...	128	125⅛	132¼	123½	350	2,520	pfd	100	61,657	6%		326.68
...	...	310	215	230	120		6,900	Fed. Mining & Smelting	100	50,400	...		23.36
96	91	98½	65½	89⅜	65	79,400	3,238,600	Fleischmann	No	4,500,000	*5.00	9 mo. 3.24	4.30
50⅞	47⅛	54⅛	37⅞	109½	43	48,900	587,900	Freeport Texas	No	729,844	4.00	4.49	5.12
92	89¼	94⅛	61	94¼	141½	128,100	818,400	General Asphalt	100	206,887	...	6 mo. ...	4.74
136	135	141	104½	150	132	1,000	41,000	pfd	100	68,742	5%	6 mo. d5.09	19.34
57⅛	57½	64½	36⅞	37	20⅜	48,600	1,084,000	Glidden Com	No	500,000	*2.00	3.37	2.88
...	...	106½	101½	105	95	770	6,160	prior pfd	100	69,167	7%	32.69	23.91
62⅞	61	82	53⅛	143½	71	181,700	3,798,400	Gold Dust	No		2.50		8.97
...	...	...	...	380	192		4,470	Hercules Powder	No	147,000	14%	22.04	16.35
...	...	...	...	125	118½		1,280	pfd	100	114,241	7%	9 mo. 24.69	28.02
69½	69	79⅛	62	84	64½	6,200	77,300	Household Prod	No	575,000	*4.00	6 mo. 2.64	5.22
7⅞	7½	17⅛	6½	20⅞	13	35,000	150,600	Intern. Agri	No	450,000			1.34
...	...	88½	53½	85	48⅜	2,900	17,300	pfd	100	100,000	7%		13.03
55	54½	72¾	40½	46	41½	821,500	10,974,100	Intern. Nickel	No	1,673,384	3.00	9 mo. 4.72	3.30
59	58½	63	43¼	60	47½	14,900	88,400	Int. Print Ink	No	256,022	2.50	6 mo. 2.58	4.98
...	...	90⅜	55½	69	49½	720	74,070	Intern. Salt	100	60,771	...	6 mo. 0.05	5.38
196½	194	242⅜	152½	202	96½	181,500	2,197,600	Johns-Mansville	No	750,000	3.00	9 mo. 4.94	4.78
84¼	83	113⅞	71⅜	124½	63⅜	38,200	545,600	Liquid Carbonic Corp	No	125,000	4.00	7.05	5.90
...	...	46	34	57½	45	2,500	40,700	Mac and Forbes	No	378,500	*3.50	9 mo. 2.34	3.62
61	58⅜	68⅜	42¼	190	117½	43,400	412,180	Mathieson Alk	No	147,207	6.00	9 mo. 9.54	10.93
122½	122½	125	120	130	115	100	2,750	pfd	100	24,750	7%	9 mo. 63.03	74.06
45	44½	54½	30⅛	33	17⅞	77,300	1,457,800	Miami Copper	5	747,116	2.00		1.53
50⅜	47	58	33	58½	29½	25,800	797,200	National Dist. Prod.	No	168,000	...		...
...	...	110⅜	67½	...	...	15,400	243,900	pfd. tem. ctfs	...	...	...		...
178½	163¼	178½	42½	136	115	13,300	151,640	National Lead	100	309,831	5%		8.90
88½	88	96⅜	43			62,800	73,100	Newport Co	50	130,000			
57½	55⅞	60⅜	38	41½	22⅜	19,100	518,300	Penick & Ford	No	433,773	...	9 mo. 1.32	1.76
...	...	404	208	217	157	28,300	148,200	Peoples Gas Chi	100	511,521	8%	9 mo. 8.98	10.81
38	37½	43½	27			22,000	1,322,700	Royal Baking, new com	100	800,000	1.00	6 mo. 0.53	1.14
...	...	...	...			1,100	8,700	pfd	100	100,000	6%	6 mo. 7.26	15.11
73½	71	94	59½	9⅜	6½	159,400	2,210,100	Spencer Kellogg	No	500,000	1.60	3.59	2.37
42½	41½	45	35½	71½	37	69,500	85,600	St Joseph Lead	10	1,950,509	*3.00		2.06
73½	71⅜	73⅞	48	59⅜	37¾	1,549,600	5,815,200	Standard Oil Co. of N. J	25	24,419,219	*1.50		1.52
46½	44⅜	47	37⅜	45½	28⅜	874,700	4,637,900	Standard Oil Co. of N. Y	25	17,118,931	1.60		0.67
17½	17½	20⅞	16	19½	10½	32,200	818,200	Tenn. Cop. & Chem	No	794,626	1.00		0.51
74½	72	85½	69⅜	82½	62½	204,900	3,048,300	Texas Gulf Sulfur	No	2,540,000	4.00	5.72	4.76
133¼	130⅜	135½	75¼	209	186½	564,100	3,302,400	Union Carbide	No	2,742,072	6.00	9 mo. 7.16	9.53
207⅜	202½	207⅜	128	138	102½	139,500	1,175,800	U. S. Ind. Alc	No	240,000	6.00	6 mo. 3.90	7.26
...	...	...	...	125½	118⅜		860	pfd	100	60,000	7%	6 mo. 19.12	36.03
82⅜	80½	116½	68	111½	60	62,800	1,382,600	Vanadium Corp	No	376,637	*4.00	6 mo. 2.57	4.97
12	11¼	24½	9½	20⅜	12	25,500	521,300	Virginia Car. com	No	486,700	...	0.69	...
38¼	38¼	65½	36½	64½	44⅜	3,800	103,120	6% pfd	100	213,392	...	7.57	d5.41
...	...	97½	86½	99½	88½	400	10,500	7% pfd	100	125,000	7%	20.09	d1.70
								NEW YORK CURB					
17½	17½	23	6	31½	16½	6,300	17,300	Acetol Prod	No	60,000	2.40		8.69
31½	31½	43½	31½	42⅜	33¼	1,300	38,300	Agfa Ansco	No	300,000	...		
460	450½	539½	146	197½	120	7,300	75,500	Aluminum Co. of America	No	1,472,625	...		3.28
...	...	108½	103½	110½	104	2,200	19,800	pfd	100	1,472,625	6%		9.28
64½	63½	69	39½	65	30⅜	36,200	932,500	Amer. Cyan	20	428,465	8%	†3.67	†2.92
...	...	40½	25½	28⅛	11⅜	15,100	159,000	Amer. Sol. & Chem. com	No	160,000	...	1.58	0.07
...	...	55½	42	47⅜	25½	9,800	78,400	pfd	No	100,000	...	6.52	3.17
...	...	45½	33	54	26½	8,000	148,100	Anglo Chile Nitrate	No	1,756,750	...	6 mo.. ...	...
7⅞	7½	10¼	4⅛	33⅜	7	5,400	103,600	Br. Celanese	No	2,650,000	...	0.55	...
...	...	...	...	46½	41	500	600	Canad. Ind. Alc	No	1,092,915	1.52	†2.87	†2.49
...	...	57⅛	25½	103	36½	5,000	104,700	Celanese Corp. of Am	No	1,000,000	...		1.72
...	...	...	...	122	34		4,700	Celluloid Co	No	194,952	...		0.87
...	...	...	...	132	103½	100	2,400	1st pfd	No	23,882	7.00		11.94
...	...	...	...	97½	75			7% pfd	No	24,551	7.00		9.96
71⅛	70½	80¾	63	92	75	7,200	53,400	Colgate-Palmolive Peet			2.00		
...	...	...	...	...	...	...	...	Courtaulds	£1	12,000,000	22½%		26.55%
...	...	25½	15¼	24⅞	20	1,100	42,400	Am. dep-rects	...	...	...		...

1929 Aug. 29 High	1929 Aug. 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Aug.	Sales Since Jan. 1	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1928	Earnings $-per share-$ 1927
								CLEVELAND					
97½	97½	98¾	97	147½	104	2,400	21,900	Cleve-Cliff Iron	No	400,000	4.00		9.74
...	...	405	200	225	112½	76	1,080	Dow Chem.	No	120,000	6.00		
...	...	107¼	14½	107	103¾	72	464	pfd.	100	30,000	7%		
...	...	...	...	...	...			Glidden	No	500,000	*2.00	3.37	2.88
...	...	105	102½	104¾	96	147	2,700	prior pfd.	100	69,167	7%	32.69	23.91
...	...	105	82	95	65½	620	14,200	Sherwin Williams	25	594,445	4.00	6.99	6.42
...	...	108	104	109½	106	561	5,000	pfd.	100	125,000	6%	39.21	37.82
...	...	29	25	28	24¾	322	2,100	Wood Chemical Prod. "A"	No	20,000	2.00		7.75
								CHICAGO					
...	...	26½	15¾	96	91½	950	20,450	Monroe Chem.	100	167,500	...		4.74
73	73	78½	73	146	127½	3,750	52,227	Monsanto Chem.	No	148,000	2.50	9 mo. 6.30	8.58
141½	139¾	140	124½	...	..	5,600	45,800	Swift & Co.	100	1,500,000	8%	9.87	8.13
76	75½	79½	49¼	...	...	38,000	271,100	U. S. Gypsum	20	691,502	1.60	6 mo. 4.42	10.08
...	...	...	...	100	55	600	67,000	United Chemicals, pfd.	50	120,000	3.00		
								CINCINNATI					
...	...	...	...	...	...	30	602	Fleishmann pfd.	100	12,200	6%	9 mo. 1,197.09	1,589.49
...	...	485	279	300	249	751	31,600	Proc. & Gam.	20	1,250,000	8.00	11.96	11.38
								PHILADELPHIA					
...	...	100	89	109½	92	1,100	13,300	Penn. Salt	50	150,000	5.00	8.27	8.09
275	275	299	157	173½	114½	33,100	1,860,400	United Gas Imp.	50	3,903,791	6.00		6.28
								MONTREAL					
10	10	...	...	...	...	1,000	35,200	Asbestos Corp.	No	200,000	...		0.87
30	30	...	...	...	...	900	10,400	pfd.	100	74,564	7%		9.32
23½	23	...	...	..	...	9,400	167,600	Canada Ind. Alc.	No	1,092,915	1.52	†2.87	†2.49
110½	109			...	...	140,000	486,200	Shawinigan W. & P.	No	1,844,700	2.00		2.41
								BALTIMORE					
...	...	...	...	28¾	17		5,300	Silica Gel	No	600,000	...		
								UNLISTED					
...	...	...	...	80	70			Agfa Ansco, pfd.	100	50,500	...		...
...	...	...	...	375	190			Hercules Powd., com.	No	147,000	14%	9 mo. 15.10	16.36
75	70	...	...	82	64			Merck. & Co., pfd.	100	33,950	...		...

*Includes extra dividends. †Class A and class B shares combined. d Deficit.

The Industry's Bonds

1929 Aug. 29 High	1929 Aug. 29 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Aug.	Sales Since Jan. 1	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
...	...	106½	103½	106¾	104	50	712	Am. Agri Chem.	1941	7½	F. A.	30,000
95½	95¼	96½	93½	97	92	64	987	Amer. Cyanid	1942	5	A. O.	
119	118	135	95½			716	716	Amer. I. G. Chem.				
101	101	102	98¼	102¾	99¾	84	2,012	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
97	97	100	93½	105½	92	191	2,281	Anglo Chilean	1945	7	M. N.	16,500
100	100	103½	100	103¾	99⅞	73	859	Atlantic Refin.	1937	5	J. J.	15,000
...	...	102	100	103½	100	20	211	By product Coke	1945	5½	M. N.	8,000
...	...	103	96½	103¾	100		61	Corn Product Refin.	1934	5	M. N.	10,000
...	...	110	103	117	106	168	677	General Asphalt	1939	6	A. O.	5,000
...	...	95	90½	95⅜	89½	5	149	Int. Agric. Corp.	1932	5	M. N.	30,000
...	...	81½	76½	86½	77	12	93	Int. Agri. Corp. stamped. extended	1942	5	M. N.	7,020
...	...	104	99			226	400	Lautaro Nitrate				
...	...	127	106½	...	...	62	1,312	Montecatini	1937	7	J. J.	
...	...	99¼	93	...	...	69	1,430	Ex War	1937	7	J. J.	
101	101	113	110	...	...		86	People's Gas & Coke	1943	6	A. O.	10,000
...	...	105½	100½	108½	102	62	439	Refunding	1947	5	M. S.	40,000
101½	100½	103⅜	100	104	102	381	3,582	Standard Oil N. J.	1946	5	F. A.	120,000
...	...	115	102	120	101½	41	581	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
...	...	82	69	91⅞	82		104	Va. Iron C. & C.	1949	5	M. S.	
								NEW YORK CURB				
100⅜	100⅜	102½	100	103½	100	189	2,144	Alum. Co. of Am 52	1952	5	M. S.	
...	...	...	...	121½	98			Amer. Com. Alc.	1943	5	M. N.	
...	...	125	104	125	99	96	1,466	Amer. Solv. & Chem.	1936	6	M. S.	
94¼	94¼	100½	93	101¾	97½	161	2,078	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	...	...	103½	98	29	341	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
90½	90⅜	94¼	90⅜	98⅜	93½	86	1,211	Shawinigan W & P	1967	4½	A. O.	
...	...	...	...	106⅜	100	5	238	Silica Gel. 6½% with warr.	1952	6½		
93	93	98⅜	90	100	95	47	375	Solvay Am. Invest. Corp.	1942	5	M. S.	15,00
99½	99¼	100¼	98⅜	101½	99⅜	224	2,088	Swift & Co.	1932	5	A. O.	50,00
100	100	104	98¼	104	99½	22	365	Westvaco Chlorine Prod.	1937	5½	M. S.	2,50

Chemical Exports Set New Six Months' Record

Total Value of Exports of Chemicals and Allied Products Exceeds By 13 Per Cent the Record for First Half of 1928—Imports Not So Large As Other Half-Year Periods Although Exceeding Last Year's Mark by 8 Per Cent.

Exports of chemicals and allied products from the United States during the first half of 1929 established a new high record, totaling $105,715,000, or 13 per cent more than the figures for the corresponding period in 1928, and higher than for any other six months' period. Imports of $123,173,000, although 8 per cent more than for the corresponding period of 1928, were not so large as for some other half-year periods.

In the industrial chemicals sold as such the total of $14,000,000 was 4 per cent above last year's figure. The trend toward increased consumption in most of the consuming markets of synthetic chemicals was evident by larger United States exports of these.

One of the best illustrations of the shifting in commodities is that of acetate of lime, which formerly was one of the leading individual chemicals exported, says the Department of Commerce. With the development of the new process for the procurement of acetic acid direct, this commodity naturally has gradually diminished in importance. Exports have felt the reaction until only 88,400 pounds, valued at $5,800, were exported the current half year, compared with 7,711,000 pounds, valued at $250,600 the first half of last year. At the same time imports of acetic acid into the United States reached 15,721,000 pounds, worth $1,194,500.

Exports of acetone exceeded those of last year by nearly $150,000, of amyl, ethyl and butyl acetates by $40,000, and nitro and aceto cellulose solutions by more than $150,000. About three-quarters of the total shipments of acetone, amounting to $383,800, were destined to the United Kingdom, with the remainder comprising small amounts to many countries. Canada and Australia are the leading purchasers of the other items.

Bleaching powder or chlorinated lime likewise showed a marked decline from 12,678,000 pounds, valued at $203,600, to 3,535,000 pounds, $83,300. In the sodium group, total of which reached $5,955,000 (340,763,000 pounds) there were the usual alterations, but the most outstanding change was in sodium hydroxide or caustic soda, which gained nearly $200,000.

Gases, another of the younger chemicals in foreign trade, continued progress to a total of $533,000 (5,910,000 pounds), most important of which is ammonia anhydrous shipped chiefly as a refrigerant.

In the import trade the outstanding commodities are glycerin and specific potassium compounds, which have shown considerable increase this year. Five times as much crude glycerin and almost three times as much refined were imported this year, or $528,000 (9,000,000 pounds) of the former and $387,000 (4,259,000 pounds) of the latter. Receipts of potassium carbonate, amounting to $529,000 (11,677,000 pounds), of caustic potash of $558,000 (7,778,000 pounds), and of bitartrate or argols of $689,000 (6,198,000 pounds) all exceeded those of last year by around $200,000 each. Sodium compounds other than cyanide, ferrocyanide, and nitrite surpassed those of last year by more than $600,000. Miscellaneous chemical compounds, comprising many commodities, were far above those of last year.

During 1927 and 1928 exports of fertilizers and fertilizer materials tended to lower shipments and imports to higher shipments. During the first half of the current year, however, the reverse has been true, with exports up 18 per cent to $10,875,000 (761,200 tons) and imports down 5 per cent to $41,127,100 (1,244,200 tons). Of the individual commodities, exports of ammonium sulfate improved one-eighth and were four times as great as the imports, which fell one-third. Exports of other nitrogenous materials were up to nearly six times the figure of last year. In the inward trade, however, receipts of calcium cyanide, calcium nitrate, and guano were considerably more, while 10 per cent less of sodium nitrate was received. The most outstanding change was the decline of 70 per cent in ammonium-sulfate nitrate imports.

All countries purchased more sulfur this year, contributing to the increase of $1,980,000 (79,400 tons) and raising the total to $8,262,600 (400,200 tons) in 1929. Although imports of pyrites were exceptionally high and reached a peak figure in 1928, the large amounts being imported continued until during the current six months $705,200 (235,900 tons) entered the United States.

Exports of coal-tar products, amounting to $9,100,000, were one-third greater than last year, while at the same time imports of $11,800,000 were 5 per cent less. That American manufacturers have somewhat stemmed the inflow of tremednous amounts of creosote oil, by establishing more plants and producing in greater amounts to help take care of the ever-increasing demand for this commodity, is evident from the falling off of 15 per cent in imports from 45,547,500 gallons to 38,976,600 gallons. However, perhaps the most noticeable change was the consequent drop in price, since the values declined 36 per cent from 17,679,000 to $4,923,000.

Both exports and imports of coal-tar colors, dyes, and stains showed much progress, with exports of $3,847,000 worth, 32 per cent greater; while imports of $4,782,000 were 44 per cent more than during the corresponding period of last year. Exports were 18,269,000 pounds and imports 4,177,000 pounds. As is true generally, imports continued to be of the higher-priced specialty dyes and exports of the bulk dyes, indigo, and sulfur colors. However, this high figure of general imports does not indicate an immediate consumption by American industry, since on May 31 the amount of dyes remaining in bonded warehouse in New York was large, 1,060,000 pounds.

Imperial Chemical Industries plans to construct a modern plant in Buenos Aires for the manufacture of tartaric acid. The wine manufacturers of Mendoza and San Juan use large quantities of tartaric acid annually. Imperial Chemical Industries has for some time considered the advisability of erecting a modern tartaric acid plant in Buenos Aires but it is only recently—and only after the recommendation of a group of their experts who studied conditions in Argentina for about a year—that a decision was reached. The new plant will be controlled by the Sociedad Anonima Rivadavia. It is also understood that the Imperial Chemical Industries is studying the possibility o ferecting other factories in Argentina and it is said that the officials of the company feel that Argentina offers splendid opportunities for those interested in chemical activities, according to the Department of Commerce.

Holland's sulfuric acid industry now produces about 200,000 tons per year. In addition to superphosphate factories, there are three independent sulfuric acid factories in Holland, of which one uses zinc blende and the others pyrites.

The Trend of Prices

Exceptional Industrial Activity Characterized Summer Season

Although a Slight Seasonal Recession Was Evidenced, It Was Seldom Pronounced and Considerably Less Than Usual—Chemical Industry Faces Heavier Fall Consumption in Firm Position and Comparatively Small Accumulated Stocks.

Abundant evidence of a summer of exceptional industrial activity and trade in both the domestic and foreign fields is furnished by the results of the major industries during the past month. New July production records have been made in the automobile and iron and steel industries. Building construction, which has shown little activity since the downward trend of early spring, made a marked improvement. Distribution of commodities, evidenced by freight car loadings, is continuing to improve. Some summer recession has been in evidence, but seldom to a very pronounced degree and in many instances later than usual. Stocks of manufactured goods and raw materials on the whole have shown no accumulation. In some cases stocks have actually decreased and in others, where there was a possibility for an over accumulation, an attempt to adjust production was noticeable.

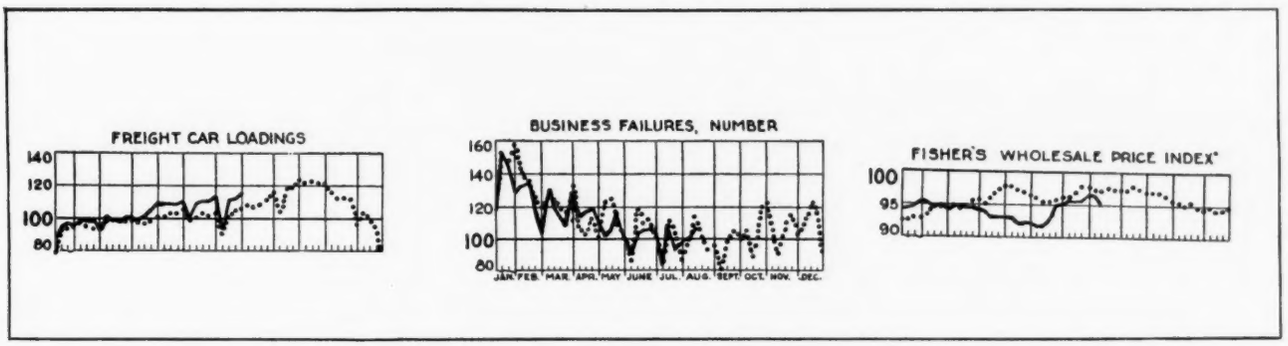
With an improved building situation, and an agricultural purchasing power about equal to last year, it seems reasonable to believe that, outside of a small seasonal decline, industrial and trade activity should continue close to the present high rates for some time, according to the National Industrial Conference Board.

The Department of Labor reports a slight decrease in employment between June and July. Industrial consumption of electrical energy indicates a moderate curtailment of operations. There has at last been some decline in steel production, although the iron and steel industry continues on an unusually high plane for late August. The output of automobiles has been decreasing moderately for some time, though the stimulation of sales by the introduction of new models has apparently caused an upturn this month. Cotton consumption was somewhat smaller last month than in June. Retail trade reports indicate some slowing up since the beginning of August. Building activity increased sharply last month but has declined in recent weeks.

"In most cases, these declines are purely seasonal and serve merely to emphasize the exceptional rates of activity that have been maintained throughout the summer. There is little doubt that business as a whole remains at a distinctly higher level than a year ago—probably higher than has ever before been witnessed at this season. With the beginning of autumn at hand, the outlook is for a continuance of active industrial operations and large trade volumes for some weeks to come. If no marked upturn is in prospect, it is only because the level of activity is already so high, says the Guaranty Trust Co.

Crop damage reports had an important effect on the price situation in July, but the general upward trend of commodity prices shown by *Bradstreet's* August 1 index was not entirely due to this cause. Ten out of thirteen groups of commodities advanced, including breadstuffs, live stock, provisions, hides and leather, textiles, metals, coal and coke, oils, naval stores and miscellaneous products. Losses were sustained in the fruit, building material and chemical and drug groups. The index was one per cent higher than on July 1, although 4.2 per cent lower than on August 1, last year. The index of the general level of farm prices in the United States, as compiled by the Department of Agriculture, advanced five points from June 15 to July 15, although it still was five points below July of last year.

With the closing of the summer season, a heavier consumption of chemicals is looked for during the next few months. Generally speaking, the market has passed through the quiet summer period in an unusually firm position and producers face the coming season with but comparatively small stocks on hand.



Business indicators prepared by the Department of Commerce. The weekly average 1923-1925 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

Acetone — Producers are not moving the volume which they had become accustomed to. It is not thought that demand has fallen off any, but that competition and increased production account for decreased business to individual producers and some slight evidences of unsteadiness in the market. Quoted prices for both synthetic and fermentation material remain unchanged but conditions are undoubtedly competitive, which combined with light demand, has made it rather difficult to maintain prices firmly at quoted levels. From the point of view of the producers, it is thought that a compensatory note is being injected into the situation by the possibilities of the adoption of a wider motion picture film by producers of that material. It is known that experiments are being conducted with film about 50 per cent wider than that at present employed, and it is pointed out that, if this is adopted, the increased consumption of acetone will relieve the conditions at present existing in the market.

Acid Acetic — Continues very firm and in good demand with no indications of any change in the immediate future in present price quotations.

Acid Chromic—Increased competition in this material has resulted in lower price quotations during the past month. The market assumed a somewhat steadier tone following the reduction to 17½ @ 20c lb., and producers look forward to a steady improvement in demand during the next few months. During the first six months of the current year, imports of chromic acid into the United States were 98,339 pounds, valued at $25,403, which was about equal to the entire 1928 imports which only totaled 99,617 pounds, valued at $24,547. Despite increased consumption, this tremendous increase in imports accounts in large measure for the weak statistical position of the market at present. About 62 per cent of the 1929 imports is shown as originating in the Netherlands and the remainder in Germany. The great increase during recent years in the use of chromic acid in electroplating various metal parts for the prevention of rust is reflected in the annual import statistics. In 1925 and 1926, the

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.23	.24	.23
.35	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.29	.35	.29
.....	.....	.38	.32	Acetin, tech drums.....lb.	.30	.32	.30
.15	.13	.....	.....	Acetone, CP, 700 lb drums c-1 wks.....lb.	.....	.15	.15
.15	.13	.12	.12				
1.75	1.65	1.65	1.65	Acetone Oil, bbls NY.....gal.	1.15	1.25	1.15
.45	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.55	.68	.45
				Acetylene Tetrachloride (see tetrachlorethane).....			
				Acids			
				Acid Acetic, 28% 400 lb bbls			
3.88	3.38	3.38	3.38	c-1 wks.....100 lb.	.....	3.88	3.88
13.68	11.92	11.92	11.92	Glacial, bbl c-1 wk.....100 lb.	.....	13.68	13.68
1.00	.98	.98	.98	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00
.80	.80	.80	.80	Technical, bbls.....lb.	.....	.80	.80
2.25	1.60	1.60	1.25	Battery, cbys.....100 lb.	1.60	2.25	2.25
.60	.57	.57	.57	Benzoic, tech, 100 lb bbls....lb.	.57	.60	.60
.11	.08½	.08½	.08½	Boric, crys. powd, 250 lb. bbls.....lb.	.05½	.06½	.06½
1.25	1.25	1.25	1.25	Broenner's, bbls.....lb.	.....	1.25	1.25
.90	.85	.85	.80	Butyric, 100% basis cbys.....lb.	.85	.90	.90
4.85	4.85	4.90	4.85	Camphoric.....lb.	.....	4.85	4.85
.28	.13	.25	.25	Carbolic, 10%, 50 gal bbls....lb.	.13	.14	.14
.16	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½
.30	.25	.37	.25	Chromic, 99%, drs extra.....lb.	.17½	.19	.23
1.06	1.00	1.00	1.00	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06
.44½	.59	.44½	.43	Citric, USP, crystals, 230 lb. bbls.....lb.	.46	.59	
.97	.95	.95	.95	Cleve's, 250 lb bbls.....lb.	.52	.54	.59
.70	.68	.60	.57	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54
.72	.72	.70	.60	97-99%, pale drs NY.....gal.	.72	.77	.77
.12	.11	.11	.10	Formic, tech 90%, 140 lb. cby.....lb.	.11½	.11½	.11½
.55	.50	.50	.50	Gallic, tech, bbls.....lb.	.50	.55	.12
.74	.74	.74	.69	USP, bbls.....lb.	.....	.74	.55
1.06	1.00	1.00	1.00	Gamma, 225 lb bbls wks.....lb.	.80	.85	.74
.63	.57	.57	.57	H, 225 lb bbls wks.....lb.	.68	.72	.99
.67	.67	.67	.65	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72
.48	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48
				Hydrochloric, CP, see Acid Muriatic.....			
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90
.06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85
.06	.04½	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.05½
.13½	.12	.13	.13	44%, light, 500 lb bbls.....lb.	.11	.11½	.12½
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42
.60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65
.08	.07½	.07½	.07½	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07½	.07½
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70
1.40	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.40
				tanks, wks. 100 lb.		1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	....
.95	.85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00
6 00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00
.11½	.10¾	.11½	.11	Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.11½
.08½	.08	.08	.07	Phosphoric 50%, 150 lb cby..lb.	.08	.08½	.08½
.16	.16	.19	.16	Syrupy, USP, 70 lb drs....lb.	.....	.16	.16
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70
.50	.40	.45	.30	Picric, kegs.....lb.	.40	.50	.50
.86	.86	.86	.86	Pyrogalic, technical, 200 lb bbls.....lb.	.....	.86	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.37	.42	.42
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.95
				tanks, wks. ton		15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½
1.52½	1.52½	1.50	1.50	Oleum, 20%, 1500 lb. drs 1c-1 wks ....100 lb.	.....	1.52½	1.52½

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

quantity imported averaged 6,300 pounds; in 1927 it rose to 15,620 pounds, whereas in 1928 it increased nearly seven times. At the rate during the first half of this year, the increase over 1927 is about fourteen times.

Acid Citric — The demand still continued to be quite expensive despite the approach of the end of the season and prices continued to be firmly maintained. Reports in the Italian press give the present world's consumption of citric acid as between 5,000 and 5,500 tons per year and state that the rate of consumption is increasing rapidly. The growing importance of Italy as an exporter of citric acid instead of citrate of lime, is shown by recent figures which indicate that whereas in 1927 Italy exported 1,981 tons of citric acid, by 1928 her exports had risen to 3,338 tons, whilst during the same period her exports of citrate of lime had declined from 3,105 to 1,627 tons. The total production of citric acid in Italy is given at about 4,000 tons per year, and it is stated that quite recently the production of the acid had been commenced in Hawaii, which is making probably two or three hundred tons a year now. Italian circles do not seem too much impressed by the danger of competition from countries such as Argentina, Brazil and South Africa which are citrus fruit growers, for, experience in Italy has shown that in order to be profitable the growing industry must be localized in a comparatively small area and that the citrate factories must be supplied with large quantities of fruit during five months without any excessive transport charges.

Acid Oxalic — Continues in very active demand and although quoted prices are maintained, it is said that somewhat higher prices have been paid for spot material which has been in very short supply. Imports are still noticeable in fairly heavy quantities. The new use of this material by the coal industry is probably chiefly responsible for the unusually heavy demand.

Acid Sulfuric — Although this is not the season of heavy business, demand has been sufficiently good to keep the market firm at all points. The mineral acids generally are moving into consumption in heavy volume.

Alcohol — With the approach of the heavy consuming season, the market is reported to be in what is probably the strongest position of the past few years. Production costs seem certain to remain high and sales already booked indicate a demand which bids fair to set a new

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
42.00	42.00	42.00	42.00	40%, lc-1 wks net ton	.....	42.00	42.00	42.00
.40	.30	.30	.30	Tannic, tech, 300 lb bbls. lb.	.30	.40	.40	.30
.38	.34½	.37	.29½	Tartaric, USP, crys, powd, 300 lb. bbls. lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls lb.	2.00	2.25	2.25	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls. lb.	.43	.47	.47	.43
				dark, bbls., lb.	.12	.20	.20	.12
.84	.78	.95	.80	Egg, edible lb.	.75	.78	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible lb.	.60	65	.65	.60
.55	.50	.50	.50	Technical lb.	.50	.55	.55	.50
				Alcohol				
				Alcohol Butyl, Normal, 50 gal drs c-1 wks lb.	.....	.1775	.17½	.17½
.20	.18½	.20	.19	Drums, 1-c-1 wks lb.	.....	.1825	.18½	.18½
.19½	.18½	.20½	.19½	Tank cars wks lb.	.....	.1725	.17½	.17½
.19	.17½	.19½	.18½	Amyl (from pentane) drs c-1 wks gal.	.....	1.67	1.67	1.67
2.25	1.75	.....	.....	Diacetone, 50 gal drs del. gal.	1.70	1.80	1.80	1.70
1.80	1.70	1.70	1.70	Ethyl, USP, 190 pf, 50 gal bbls gal.	.....	2.69½	2.69½	2.69½
3.70	2.65	3.70	3.70	Anhydrous, drums gal.	.....	.71	.71	.71
.55	.50	.50	.50	Completely denatured, No. 1, 190 pf, 50 gal drs drums extra gal.	.....	.52	.52	.49
.52	.48½	.52	.37½	No. 5, 188 pf, 50 gal drs. drums extra gal.	.....	.51	.51	.48
.50	.43	.50	.29	Tank, cars gal.	.....	.49	.49	.46
.46	.41	.46	.25	Isopropyl, ref, gal drs gal.	1.00	1.25	1.25	1.00
1.25	1.00	1.00	1.00	Propyl Normal, 50 gal dr. gal.	.....	1.00	1.00	1.00
1.00	1.00	1.00	1.00	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
.82	.80	.80	.80	Alpha-Naphthol, crude, 300 lb bbls lb.	.....	.65	.65	.65
.65	.65	.65	.65	Alpha-Naphthylamine, 350 lb bbls lb.	.32	.34	.34	.32
.37	.35	.35	.35	Alum Ammonia, lump, 400 lb bbls, lc-1 wks 100 lb.	3.25	3.30	3.30	3.25
3.30	3.25	3.25	3.15	Chrome, 500 lb casks, wks 100 lb.	5.00	5.25	5.50	5.00
5.50	5.25	5.25	5.25	Potash, lump, 400 lb casks wks 100 lb.	3.00	3.10	3.20	3.00
3.20	3.10	3.50	3.10	Chrome, 500 lb casks wks 100 lb.	5.25	5.50	5.50	5.25
5.50	5.25	5.25	5.25	Soda, ground, 400 lb bbls wks 100 lb.	.....	3.75	3.75	3.75
3.75	3.75	3.75	3.75	Aluminum Metal, c-1 NY 100 lb.	.....	24.30	24.30	24.30
26.00	24.30	27.00	26.00	Chloride Anhydrous, 275 lb drums lb.	.....	.05	.40	.05
.40	.35	.35	.35	Hydrate, 96%, light, 90 lb bbls lb.	.17	.18	.18	.17
.18	.17	.17	.17	Stearate, 100 lb bbls lb.	.25	.26	.26	.25
.24	.18	.23	.23	Sulfate, Iron, free, bags c-1 wks 100 lb.	1.95	2.05	2.05	1.95
1.75	1.75	1.75	1.75	Coml, bags c-1 wks 100 lb.	.....	1.40	1.40	1.40
1.40	1.40	1.40	1.35	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
1.15	1.15	1.15	1.15	**Ammonium**				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl. lb.	.14	.14	.14	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del. lb.	.....	.03½	.03½	.03½
				Bicarbonate, bbls., f.o.b. plant 100 lb.	.....	5.15	6.50	5.15
.22	.21	.21	.21	Bifluoride, 300 lb bbls lb.	.21	.22	.22	.21
.09	.08½	.08½	.08½	Carbonate, tech, 500 lb cs. lb.	.09	.12	.12	.09
5.15	4.45	5.05	4.85	Chloride, white, 100 lb. bbls wks 100 lb.	4.45	5.15	5.15	4.45
5.75	5.25	.07	.05½	Gray, 250 lb bbls wks lb.	5.25	5.75	5.75	5.25
.11½	.11	.11	.11	Lump, 500 lb cks spot lb.	.11	.11½	.11½	.11
.16	.15	.15	.15	Lactate, 500 lb bbls lb.	.15	.16	.16	.15
.10	.06	.06	.06	Nitrate, tech, casks lb.	.06	.10	.10	.06
.38	.27½	.27½	.27½	Persulfate, 112 lb kegs lb.	.31	.34	.34	.31
.18	.18	.18	.18	Phosphate, tech, powd, 325 lb bbls lb.	.12½	.13	.13	.12½
2.90	2.20	2.30	2.55	Sulfate, bulk c-1 100 lb.	2.10	2.20	2.40	2.05
3.00	2.50	2.55	2.35	Southern points 100 lb.	2.10	2.20	2.45	2.05
60.85	60.85	59.70	56.85	Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f. ton	52.40	52.70	60.85	52.40
.60	.55	.55	.55	Sulfocyanide, kegs lb.	.36	.48	.48	.36
2.25	1.72	2.25	1.90	Amyl Acetate, (from pentane) drs gal.	1.60	1.70	1.70	1.60
.....	.....	.....	.....	Tech., drs gal.	1.60	1.70	1.70	1 60
				Alcohol, see Fusel Oil				
				Furoate, 1 lb tins lb.		5.00		
.16½	.15½	.15½	.15	Aniline Oil, 960 lb drs lb.	.15½	.16½	.16½	.15½
.48	.41	.41	.41	Annatto, fine lb.	.34	.37	.37	.34
1.00	.90	.90	.90	Anthraquinone, sublimed, 125 lb bbls lb.	.80	.90	.90	.80
.12	.09½	.11½	.14	Antimony, metal slabs, ton lots lb.	.....	.08½	.10	.08½
.12	.10	.15½	.14	Needle, powd, 100 lb cs. lb.	.....	.10	.10	.09
.18	.17	.17	.17	Chloride, soln (butter of) cbys. lb.	.17	.18	.18	.17
.12	.09½	.16½	.16½	Oxide, 500 lb bbls lb.	.09	.09½	.10	.09
.....	.....	.28	.25½	Salt, 66%, tins lb.	.25½	.26	.26	.25½
.20	.16	.20	.16	Sulfuret, golden, bbls lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, cone, 600 lb bbls lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls lb.	.15	.16	.16	.15
.08	.08	.15	.12½	Argols, 80%, casks lb.	.....	.08	.08	.08
.16	.15	.08	.03	Coude, 30%, casks lb.	.15	.16	.16	.15
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs. lb.	.09	.11	.11	.09
.04	.03¾	.04	.03½	White, 112 lb kegs lb.	.04	.04½	.04½	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks ton	.....	15.00	15.00	4.75

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

record for volume. Surplus stocks are at a minimum and producers face the coming season in very satisfactory position. The problem of meeting the anti-freeze demand in a short space of time, which ordinarily places a tremendous burden upon producers' capacity, has been met to a certain extent by some considerable movement of this material at an early stage of the game, thus eliminating as far as possible an almost inevitable tie-up later in the season. The scheduled increase in price of 1c per gal. goes into effect as of September 1.

Aluminum Sulfate — Despite the fact that production has been maintained on a very broad basis, most manufacturers are expressing very firm views of the market. Paper manufacturers are beginning to order out larger quantities against contracts previously entered into. The commercial grade is held at $1.40 @ $1.50 per 100 lbs., while sales of iron-free are being made at $1.90 @ $3.30 per 100 lbs.

Ammonia — The market has been well sold up and consequently firm.

Ammonium Chloride — Has been in good condition with domestic producers in good position as they await the increased demand of the Fall season.

Ammonium Sulfate — In common with the other members of the fertilizer group, there has been but little trade in ammonium sulfate during the past month. Most factors, however, are looking forward to increased activity with the coming of the Fall months. The principle feature of this country's export trade in fertilizers during the first six months of this year was the 22 per cent increase in sales of ammonium sulfate for export. Shipments during that period amounted to 59,666 tons valued at $2,701,041, as compared with 48,514 tons during the corresponding period of 1928. Shipments of all fertilizer materials from the United States to foreign countries for the first six months of 1929 amounted to 761,224 tons, valued at $10,875,000, as compared with 669,505 tons, valued at $9,230,877, during the same period of 1928. This is an increase in tonnage of 14 per cent.

Antimony — The metal market, after being steady for the first half of the past month, improved in tone and became firm and active during the closing weeks of the month, with the result that prices advanced to 8⅞c lb. Consuming demand improved considerably and trade became quite active. Both the needle and the oxide continued unchanged in the positions they held when last reported.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks....ton	58.00	60.00	57.00
.12¼	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.15	.14
65.00	54.00	65.00	57.50	Chloride, 600 lb bbl wks...ton	65.00	69.00	69.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08½	.08½	.08½	.08½
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks.....ton	23.00	24.00	24.00	23.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	8.00	5.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	...34	.35	.37	.34
.43	.41	.46	.38	Refined, cases.....lb.	.....	.40	.42	.41
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53	.51
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65	.60
				Benzene			
.23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74	.70
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.24	.26	.26	.24
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.60	.65	.68	.60
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	80.00	90.00	90.00	80.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-l wks contract.....100 lb.	.....	2.25	2.25	2.25
2.00	2.00	2.25	2.00	700 lb drs c-l wks contract .....100 lb.	.....	4.00	4.00	4.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	4.50	4.60	4.00
5.35	4.75	.....	.....	Chicago.....Unit	.....	5.00	5.00	4.40
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.50	4.70	4.25
.35	.31	.30	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.....	.35	.35	.32
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	42.00	42.00	42.00
.07	.06	.06	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07	.06
.08½	.08½	.08¼	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	31.00	35.00	30.00
.05	..2½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½	.02½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.10½	.12	.12	.10½
.10	.08	.08	.08	Paste, bbls.....lb.	.10	.10½	.10½	.10
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00	26.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20	.60
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25	.55
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs... .....lb.	18.4	18.8	18.8	18.4
1.55	1.35	1.55	1.42	Tank, wks.....lb.	.....	18.1	18.1	18.1
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.....	.70	.70	.70
				Carbitol s ee Diethylene Glycol Mono (Butyl Ether).....	.....	.....	.....	.....
				Cellosolv e (see Ethylene glycol mono b utyl ether).....				
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50	.50
.36	.34	.34	.34	Propionate, drs.....lb.	.34	.36	.36	.34
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.....	.60	.60	.60
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60	.57
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75	.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-l.....100 lb.	.....	4.50	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-l wks.....lb.	.07	.09	.09	.07
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06	.05
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-l.....lb.	1.00	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-l wks.....ton	.....	22.75	25.00	22.75
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-l fob wks .....ton	20.00	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 100 lb bags.....ton	.....	42.00	52.00	42.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08¼	.08	.07
				Stearate, 100 lb bbls.....lb.	.25	.26	.26	.25
				Calurea, bags S. points. c.i.f. ton	.....	82.15	82.15	82.15
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.22	.24	.24	.22
				Carbitol, (See Diethylene Gycol Mono Methyl Ether).....	.....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-l.....lb.	.08	.15	.15	.08
.12	.12	.12	.12	Black, 100-300 lb cases 1c-l NY.....lb.	.....	.12	.12	.12
.06	.05½	.05½	.05½	Bisulfide, 500 lb drs 1c-l NY.....lb.	.05½	.06	.06	.05½
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.06	.06
.07½	07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07	.07½	.06½
.58	.45	.50	.50	Carnauba Wax, Flor, bags....lb.	.36	.37	.43	.39
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.....	.35	.40	.34½
.38	.34	.37	.24	No. 2 N Country, bags.....lb.	.....	.28	.32	.28
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.32	.33	.36	.32
.32	.25	.....	.....	No. 3 N. C.....lb.	.....	.25	.25	.24
.32	25½	.....	.....	No. 3 Chalky.....lb.	.....	.25	.26	.25
.18½	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.15	.15½	.16	.15

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DU PONT

Organic Chemicals

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

Blood — The one exception in the general slackness which has prevailed during the past month in the fertilizer market, has been in blood. This market has been very strong due to the fact that there has been heavy buying for feeding purposes which has greatly stimulated business. As a result prices have advanced to $4.50 per unit in New York and $5.00 per unit in Chicago.

Calcium Chloride — Although as might be expected, there has been some falling off in demand for this material, most producers express the view that some demand will continue to be felt well over into the Fall season. Stocks have been considerably reduced by the record breaking demand of the past season and the market is firm with prices well maintained. In the first six months of 1929 the United States exports of calcium chloride equaled nearly a quarter million dollars in value. This chemical is separately classified this year for the first time and the value of the exports for the first half of the year is evidence of its growing importance in the United States foreign trade in chemicals. The total value of the half year sales to foreign countries amounted to $244,102, of which Canada took the bulk of $228,220 worth. Total North American shipments amounted to $234,799, while Europe accounted for $3,609 worth, South America for $3,705 worth and Far East and Africa for $1,989 worth.

Carbon Tetrachloride — Consumption has been holding up very well over the past few months and although a slight let-up in new business has recently been noted, most producers have been actively engaged in filling orders against contracts. The price structure is firm with sales being reported at 6¼c @ 7c lb.

Carnauba Wax — There has been considerable talk during the past month of increased strength in this market. Thus far, however, there have been no indications of any great change in the domestic market although reports from Brazil bear out to some extent the opinion that a moderate upward movement is due. About 43 per cent of the area of Brazil is suitable to the growth of the carnauba palm, but the production centers chiefly in the northeastern States of Ceara, Piauhy, Parahyba, Rio Grande do Norte and Maranhao. The most important ports of exports are Portaloza (capital and leading port of the State of Ceara) and Ilha do Cajueiro; exports are also made from Recife (Pernambuco), Bahia and Rio de Janeiro. According to official statistics, the exports of carnauba wax

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether).....			
				Acetate (see Ethylene glycol mono ethyl ether acetate)..			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs....lb.	.26	.30	.26
.20	.18	.18	.18	Shell, cases.....lb.	.18	.20	.20
.32	.30	.34	.26	Transparent, cases.....lb.	.30	.32	.32
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs .lb.	1.20	1.25	1.25
.03½	.03	.03	.03	Chalk, dropped, 175 lb bbls...lb.	.03	.03½	.03½
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.02	.03½	.03½
.03½	.02½	.04½	.04½	Light, 250 lb casks.....lb.	.02½	.03½	.03½
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks.....bu.	.18	.19	.19
.06½	.06	.06	.06	Willow, powd, 100 lb bbl wks.....lb.	.06	.06½	.06½
.05	.04	.04	.04	Wood, powd, 100 lb bbls...lb.	.04	.05	.05
.03	.02	.03	.02½	Chestnut, clarified bbls wks,..lb.	.02½	.03	.02
.02	.01½	.02	.01½	25% tks wks.....lb.	.01½	.02½	.02½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04 4/5	.04 4/5
.06	.05½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06
9.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00
.02	.01½	.01½	.01½	Powdered, bbls.....lb.	.01½	.02	.02
12.00	10.00	10.00	10.00	Pulverized, bbls wks.....ton	10.00	12.00	12.00
25.00	15.00	15.00	15.00	Imported, lump, bulk.....ton	15.00	25.00	25.00
.03½	.03	.03	.03	Powdered, bbls.....lb.	.03	.03½	.03½
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls 1c-1 wks contract .....lb.	.07½	.08½	.08½
.....	.....	.....	.....	cyls, cl wks,. contract ...lb.	.....	.04½	.04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract.....lb.	.....	.03	.03
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs 1c-1 wks.....lb.	.08½	.09½	.09½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs..lb.	.....	.16	.20
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls.....lb.	1.00	1.35	1.35
.29	.26	.27	.26	Chrome, Green, CP.....lb.	.26	.29	.29
.11	.06½	.06½	.06½	Commercial.....lb.	.06½	.11	.11
.17	.15½	.17½	.16½	Yellow.....lb.	.17	.18	.18
.05½	.04½	.05	.04½	Chromium, Acetate, 8% Chrome bbls.....lb.	.04½	.05½	.05½
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls.....lb.	.....	.05½	.05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl..lb.	.27	.28	.28
.35½	.34½	.34½	.34½	Oxide, green, bbls.....lb.	.34½	.35½	.35½
9.50	9.00	9.50	9.00	Coal tar, bbls.....bbl	10.00	10.50	10.50
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags....lb.	2.10	2.22	2.22
.87	.84	.92	.77	Cochineal, gray or black bag..lb.	.....	.95	.95
.86	.86	.92	.77	Teneriffe silver, bags.....lb.	.....	.95	.95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol...100 lb.	.....	17.78	24.00
.17½	.16	.16½	.06½	Carbonate, 400 lb bbls.....lb.	.13	.21½	.25
.28	.28	.28	.28	Chloride, 250 lb bbls.....lb.	.25	.28	.28
.50	.48	.48	.48	Cyanide, 100 lb drs.....lb.	.50	.55	.60
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls.....lb.	.24	.32	.32
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls.....lb.	.18	.19	.19
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks...100 lb.	.....	6.00	7.00
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks.....ton	13.00	14.00	14.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls.....100 lb.	1.25	1.35	1.35
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls.....lb.	.40	.42	.42
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1...ton	.....	.....	.....
.....	.....	42.00	20.00	Meal S. E. bulk.....ton	.....	.....	.....
38.00	36.00	35.00	21.50	7% Amm., bags mills...ton	37.50	38.00	38.00
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls.....lb.	.....	.26½	.28
.42	.40	.40	.40	Creosote, USP, 42 lb cbys....lb.	.40	.42	.42
.19	.17	.20	.20	Oil, Natural, 50 gal drs....gal.	.17	.19	.19
.23	.21	.25	.25	10-15% tar acid.....gal.	.21	.23	.23
.28	.25	.....	.....	25-30% tar acid.....gal.	.25	.28	.28
.20	.17½	.17½	.17½	Cresol, USP, drums.....lb.	.14	.17	.17
.17	.16	.17	.16	Crotonaldehyde, 50 gal dr....lb.	.32	.36	
.18½	.18½	.18½	.15	Cudbear, English.....lb.	.16	.17	.17
.07	.06	.05	.05½	Cutch, Rangoon, 100 lb bales..lb.	.14	.16	.16
1.75	1.67½	1.82½	1.67½	Borneo, Solid, 100 lb bale..lb.	.08	08½	.08½
5.12	3.77	3.92	3.77	Cyanamide, bulk c-1 wks Amm. .....lb.	.....	1.70	1.70
5.07	3.72	3.87	3.72	Dextrin, corn, 140 lb bags.100 lb.	4.62	4.82	4.82
.09	.08	.08½	.08½	White, 130 lb bags.....100 lb.	4.57	4.77	4.77
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs..lb.	.08	.09	.09
.08½	.08	.08½	.08	White, 220 lb bags 1c-1....lb.	.08	.09	.09
.....	.....	3.80	3.80	Tapioca, 200 lb bags 1c-1...lb.	.08	.08½	.08½
3.80	3.80	2.95	2.85	Diaminophenol, 100 lb kegs...lb.	.....	3.80	3.80
2.90	2.85	3.25	3.25	Diamylphthalate, drs wks...gal.	.....	3.80	3.80
.28	.26½	.31½	.29½	Dianisidine, 100 lb kegs.....lb.	3.00	3.10	3.10
.31½	.29½	.55	.55	Dibutylphthalate, wks.....lb.	.....	.26½	.26½
.....	.....	.....	.....	Dibutyltartrate, 50 gal drs....lb.	.29½	.31½	.31½
.65	.55	.23	.23	Dichloroethylether, 50 gal drs lb.	.05	.07	.13
.25	.23	2.15	2.15	Dichloromethane, drs wks....lb.	.55	.65	.65
2.15	2.15	1 85	1.85	Diethylamine, 400 lb drs.....lb.	2.75	3.00	3.00
2.00	1.85	.55	.55	Diethylcarbonate, drs .....gal.	1.85	1.90	1.90
.60	.55.	20	.20	Diethylaniline, 850 lb drs.....lb.	.55	.60	.60
.15	.10	.....	.....	Diethyleneglycol, drs.....lb.	.10	.12	.13
.35	.25	.....	.....	Mono ethyl ether, drs....lb.	.13	.15	.15
.....	.....	.....	.....	Mono butyl ether, drs....lb.	.28	.30	.30
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr.....lb.	.15	.18	.22
.67	.64	.64	.64	Diethylene oxide, 50 gal dr....lb.	.....	.50	.50
.26	.24	.25	.25	Diethylorthotoluidin, drs.....lb.	.64	.67	.67
.35	.30	.30	.30	Diethyl phthalate, 1000 lb drums.....lb.	.24	.26	.26
2 62	2.62	2.60	2.60	Diethylsulfate, technical, 50 gal drums.....lb.	.30	.35	.35
.32	.30	.32	.30	Dimethylamine, 400 lb drs...lb.	....	2.62	2.62
				Dimethylaniline, 340 lb drs...lb.	.30	.32	.32

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PIGMENTS

What Are Your Needs In

Barium Carbonate

Bi-Carbonate of Soda

Bi-Chromate of Soda

Blue Vitriol—(Crystal, Granular and Powdered)

Calcium Chloride—(Flake and Solid)

Carbon Bi-Sulphide

Carbon Tetra Chloride

Caustic Soda 76%—(Flake and Solid)

Copperas—(Sugar, Crystal and Powdered)

Formaldehyde 40° Water White

Nickel Salts—Single and Double

Sodium Cyanide 96-98%

Soda Ash 58% All Grades

Sulphate of Alumina—Com'l.

Sulphur—Ground

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Milwaukee
Newark
New Haven
New Orleans
Paterson
Philadelphia
Pittsburgh
St. Louis
St. Paul

Los Angeles: 363 New High St.

San Francisco: 576 Mission St.

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

from Brazil during the period 1924-1926, inclusive, were as follows:

Year	*Metric tons*	*Value*
1924.....	25,451	$2,652,000
1925.....	34,062	3,836,000
1926.....	38,649	3,600,000
1927.....	34,112	3,997,000
1928 (11 mon.)	38,417	3,812,000

The leading countries of destination, in the order named, are the United States, Great Britain and France.

Casein — Buying activity has continued in fairly active manner during the past month and shipments against previously closed contracts were generally in good volume. Only limited supplies of Argentine material has been available and there are reports from there of a drought. However, as this is the midst of the non-producing season, dry weather would have little or no effect at this time. French material was strong again with most of it going to European buyers. Domestic trade has been active at previously quoted levels.

Production of casein in the United States during 1928 reported to the Department of Commerce by 140 factories amounted to 22,151,000 pounds, of which nearly one-third (7,053,000 pounds) was manufactured in California. One-fourth (4,936,000 pounds) was manufactured in the State of New York, and one-fourth (4,966,000 pounds) in Wisconsin. Vermont, Illinois and Idaho produced respectively 2,111,000 pounds, 697,000 pounds, and 633,000 pounds.

Chlorine — Shipments have continued to go forward against outstanding contracts and an undertone of general firmness continued to feature the market. Demand from the paper and pulp industry especially continued heavy.

Copper Carbonate — There has been a satisfactory movement to platers, and with automobile producers working on their fall and winter models a greater demand is looked forward to over the next few months. Prices are firm at 13c @ 21½c lb., depending upon strength.

Copper Sulfate — While the market has in general been steady reflecting the steadiness of the metal markets, sales have been purely routine in nature due to the fact that the season of heavy consumption has past. It is expected that large quantities will be needed for export to Mexico and Latin America in the near future. While the copper market has been unchanged in price over a considerable period the general sentiment recently has been towards an upward price tendency due, it is said, to increased foreign buying.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15½
.19	.18	.18	.18	Dinitrochlorine, 300 lb bbl....lb.	.18	.19	.19	.18
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.15
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	18	.19	.19	.18
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
				Diphenyl.....lb.	.40	.50	.50	.40
.47	.45	.48	.45	Diphenylamine.....lb.	.....	.40	.47	.40
.72	.40	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
.30	.26	.26	.26	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
62.00	58.00	49.00	41.00	Divi Divi pods, bgs shipmt..ton	.....	48.00	57.00	48.00
.05½	.05	.04	.04	Extract.....lb.	.05	.05½	.05½	.05
.82	.73	.84	.72	Egg Yolk, 200 lb cases.....lb.	.77	.79	.84	.77
1.75	1.7	2.00	1.75	Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.90	1.90	1.70
.38	.37	.45	.37	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
1.05	.75	.90	.90	Ethyl Acetate, 85% Ester, tanks.....lb.	.....	12.02	12.02	12.02
1.25	1.10	1.10	1.03	drums.....lb.	12.05	12.09	12.09	12.05
.....	.....	.....	.....	Acetoacetate, 50 gal drs...gal.	.65	.68	.68	.65
1.11	1.05	1.05	1.05	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.70	.70	.50	.50	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.....	.....	.....	.....	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.22	.22	.22	.22	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr.gal.	.35	.40	.40	.35
.....	.....	.....	.....	Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
				Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
3.50	3.50	3.50	3.50	Lactate, drums works.....lb.	.25	.29	.35	.25
.30	.30	.30	.30	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.55	.45	.45	.45	Oxalate, drums works.....lb.	.45	.55	.55	.45
.36	.30	.....	.....	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
.70	.70	.70	.70	Ethylene Bromide, 60 lb dr...lb.	.....	.70	.70	.79
.85	.75	.75	.75	Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.11	.07	.15	.11	Dichloride, 50 gal drums...lb.	.05	.07	.10	.05
.40	.25	.30	.30	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.27	.31	.....	.....	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.20	.24	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.23	.26	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
				Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.62	.65	.65	.62
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	25.00	20.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works.....ton	15.00	.21	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.07½	.09	.09	.07½
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	3.85&10	4.00&10	3.85&10
4.75&50	4.00&50	3.50	4.24	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	3.50&50	4.00&50	3.50&50
1.15	1.10	1.10	.90	Flavine, lemon, 55 lb cases...lb.	1.10	1.15	1.15	1.10
1.15	1.10	1.10	.85	Orange, 70 lb cases.....lb.	1.10	1.15	1.15	1.10
				Flaxseed.....lb.	.....	.....		
.....	.....	.....	.....	Ex-dock.....ton	.....	25.00	25.00	25.00
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00
				Formaldehyde				
.....	.....	.....	.....	Formaldehyde, aniline, 100 lb.	.....	.....	.....	.....
.42	.39	.39	.39	drums.....lb.	.39	.42	.42	.39
.09	.08½	.11½	.08¾	USP, 400 lb bbls wks.....lb.	.08½	.09	.10	.08½
.04	.02½	.02½	.02½	Fossil Flour.....lb.	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Fullers Earth, bulk, mines..ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Imp. powd c-1 bags.....ton	25.00	30.00	30.00	25.00
.19½	.1	.17½	.17½	Furfural 500 lb drums.....lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuramide (tech) 100 lb dr..lb.	.....	.30	.30	.30
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Alcohol, (tech) 100 lb dr....lb.	.....	.50	.50	.50
.....	.....	.....	.....	Furoic Acid (tech) 100 lb dr...lb.	.....	.50	1.00	.50
1.35	1.35	1.69	1.35	Fusel Oil, 10% impurities ...gal.	.....	1.35	1.35	1.35
.05	.0	.04	.04	Fustic, chips.....lb.	.04	.05	.05	.04
.22	.20	.20	.20	Crystals, 100 lb boxes.....lb.	.20	.22	.22	.20
.10	.09	.09	.09	Liquid, 50°, 600 lb bbls....lb.	.09	10	.10	.09
.23	.20	.20	.20	Solid, 50 lb boxes.....lb.	.14	.16	.16	14
32.00	30.00	30.00	30.00	Sticks.....ton	25.00	26.00	26.00	25.00
.52	.50	.50	.50	G Salt paste, 360 lb bbls.....lb.	.45	.50	.52	.45
21	.20	.20	.20	Gall Extract.....lb.	.20	.21	.21	.20
.09	.08	.08	.06	Gambier, common 200 lb cs...lb.	.06	.07	.07	.06
.14	.12	.12	.12	25% liquid, 450 lb bbls....lb.	.12	.14	.14	.12
.12	.11	.23	.11	Singapore cubes, 150 lb bg..lb.	.08½	.09	.09	.08½
.50	.45	.45	.30	Gelatin, tech, 100 lb cases....lb.	.45	.50	.50	.45
3.24	3.14	3.14	3.14	Bags, c-1 NY.....100 lb.	3.14	3.24	3.24	3.14
1.00	.70	1.05	1.05	Glauber's Salt, tech, c-1 wks.....100 lb.	1.00	1.70	1.70	.70
3.34	3.24	3.24	3.24	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.34	3.20
3.14	3.14	3.14	3.14	Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	3.14	3.14
.24	.20	.20	.20	Glue, medium white, bbls ...lb.	.20	.24	.24	.20
.26	.22	.22	.22	Pure white, bbls.....lb.	.22	.26	.26	.22
.19	.15	.29	.22	Glycerin, CP, 550 lb drs.....lb.	.13½	.14	.16	.13½
.15	.11½	.25	.17	Dynamite, 100 lb drs.....lb.	.10¼	.11	.12½	.10¼
.10½	.08½	.....	.....	Saponification, tanks.....lb.	.07½	.08	.08½	.07½
.09¼	.07¼	.....	.....	Soap Lye, tanks.....lb.	.06¾	.07	.07½	.06¾
35.00	15.00	15.00	15.00	Graphite, crude, 220 lb bgs...ton	15.00	35.00	35.00	15.00
.09	.06	.05	.05	Flake, 500 lb bbls.....lb.	.06	.09	.09	.06
				Gums				
.04½	.03¾	.03¾	.03¾	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03¾	.04½	.04½	.03
.06½	06	.06	.06	Powd, 150 lb bags .....lb.	.06	.06½	.06½	.06¾

Oxalic Acid
Chlorate Soda
Phosphorous Compounds

MANUFACTURED BY

OLDBURY ELECTRO-CHEMICAL CO., NIAGARA FALLS, N. Y.

JOSEPH TURNER & CO.

19 Cedar St. -:- New York

METHANOL
95-97% PURE AND DENATURING
METHYL ACETONE

WOOD PRODUCTS CO.

BUFFALO — REFINERS OF METHANOL — NEW YORK

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

It was reported that over 80 million pounds of copper had been engaged for export during the first three weeks of August. The volume of domestic business has not been up to normal but the inquiry is steadily increasing.

Copperas — Continues in very firm position with considerable quantities moving out to water control stations for purification purposes. Most producers are carrying a very satisfactory amount of contract orders on their books and it seems quite likely that the movement into consuming channels will remain heavy.

Epsom Salt — Increased movement is reported into the rayon and other industries abroad, which has been reflected here in and increased strength in its market position.

Ethyl Acetate — Demand during the past month has been quite heavy and shipments are reported as being well above seasonal averages.

Fish Scrap — The past month has witnessed a decided improvement in the size of the menhaden catch and as a result of the increased supplies, prices have been lowered to $3.85 & 10 per unit.

Formaldehyde — Despite lower price quotations, the market was far from being in favorable position. Competitive conditions still prevail and such indications as there are point to still lower prices. The fact that the raw material has maintained an easy undertone has not helped matters any.

Glycerin — The market continues in easy position both here and abroad with the sales in most inactive condition.

Gums — Activity in this market during the past month has been rather sluggish with what selling there was, being of the jobbing variety. Dammar was reported to be the weak spot in the market with strong competition resulting in lowered prices. Sandarac has continued its upward price course during the past month and has now reached a new high of 70c & 72c lb. with but very little material available.

Lithopone — Imports of lithopone into the United States totaled 10,185,000 pounds, valued at $446,000 during the first six months of 1929, the Netherlands furnishing 75 per cent of the imports, and Belgium and Germany 16 and 7 per cent, respectively. Exports amounted to a value of $259,690 or nearly $100,000 more than for the first half of 1928. Nearly 90 per cent, or $220,000 worth, was shipped

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
				Gilsonite Selects, 200 lb bags				
65.00	55.00	55.00	55.00	.....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.22	.22½	.26	.22
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags.....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.16	.16½	.17½	.16
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.26	.28	.30½	.26
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.....	.21½	.24	.21½
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.10	.11½	.14	.10
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.16	.17	.17	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic.....lb.	.58	.60	.62	.58
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.15½	.16	.16½	.15½
.14	.13	.14½	.13	Loba C.....lb.	.13½	.14	.14½	.13½
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	.15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.20	.21	.23	.20
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....lb.	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	.38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
				Sandarac, prime quality, 200				
.60	.26	.27	.25	lb bags & 300 lb casks...lb	.70	.72	.72	.60
.....	.....	.....	.....	Helium, 1 lit. bot. .....lit	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.17	.20	.11	.17
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03½	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03½	.03½	.03½	.03½
16.00	16.00	16.00	16.00	Bark.....ton	.....	16.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs .lb.	.48	.50	.58	.48
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.75	4.00	3.75
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.75	3.90	3.75
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15	.18	20% paste, drums.....lb.	.15	.18	.18	.15
.08	.07½	.07½	.07½	Solid, powder.....lb.	.07½	.08	.08	.07½
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03½	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03½	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.16½	.18	.16½
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08¼	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08½	.08½
.09¼	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09½	.09½
.09	.09	.09½	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09½	.09
.08¼	.08¼	.09	.08¼	Sulfate, 500 lb bbls wk...lb.	.....	.08¼	.08¼	.08¼
				Leuna saltpetre, bags c.i.f...ton	.....	52.40	52.40	52.00
				S. points c. i. f.....ton	.....	52.70	52.70	52.30
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls 1c-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08¼	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
.06½	.06	.06½	.06	Magnesium Carb, tech, 70 lb bags NY.....lb.	.06	.06½	.06½	.06

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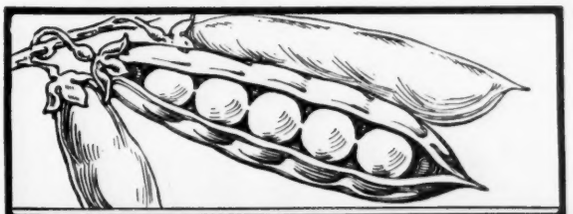

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Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

to Canada. Of 15 other countries taking shipments, Australia was the only one taking more than $10,000.

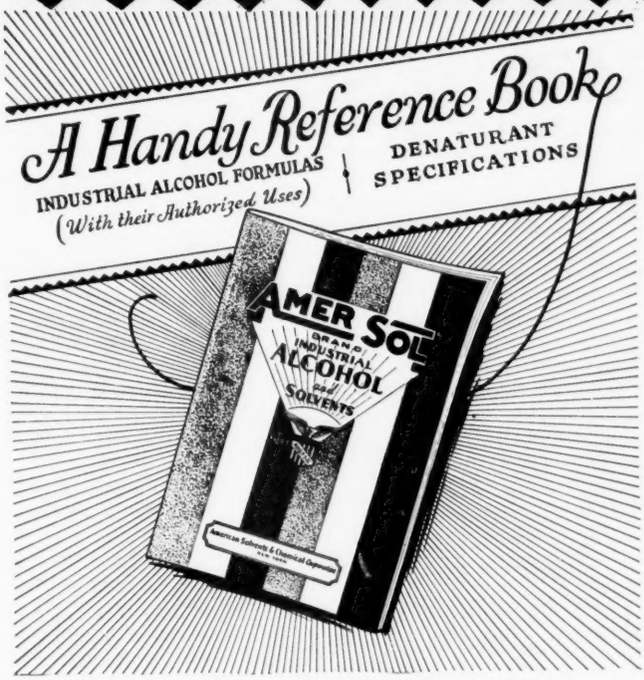
Mercury — Continues to be very scarce on spot with quotations at $125.00 @ $126.00 per flask and sellers very firm at that price. They report good demand for all quantities and indicate that it was becoming increasingly difficult to get large amounts. The markets abroad remain very steady.

Methanol — The market has not been especially active during the past month and conditions have rather favored the buyer rather than the seller. The production of synthetic methanol is cutting into the market for the natural product and it is believed that eventually the latter will find its sole market in the denaturing grade. For the six months ended with June domestic methanol production totaled 4,204,227 gallons of crude and 2,787,801 gallons of refined, against 3,844,752 gallons and 2,957,668 gallons, respectively, in the corresponding period a year ago. Acetate of lime production for the period amounted to 70,991,251 pounds, against 69,329,181 pounds a year ago. Crude methanol production in Canada for the first half of 1929 totaled 253,533 gallons, against 232,284 gallons last year, while refined amounted to 276,900 gallons, against 214,550 gallons. The production of acetate of lime aggregated 6,019,066 pounds, against 5,720,729 pounds. June production of crude methanol totaled 665,534 gallons, against 730,785 gallons in May, and the output of refined aggregated 423,811 gallons, against 423,244 gallons, according to figures complied to-day by the Department of Commerce. Acetate of lime out for the month amounted to 11,714,387 pounds, against 12,446,201 pounds in May.

Nitrogenous Material — Has been quiet and unchanged during the past month. A feature of this country's export trade in fertilizers during the first six months of this year was a five-fold increase in sales of this material as compared with those of the corresponding period of last year. Exports for that period totaled 12,763 tons valued at $637,256, which compared with 2,704 tons valued at $115,421 in the same period of 1928.

Phenol — The same tight conditions continue to prevail in this market with no supplies available on spot although quotations would be nominally about 15½c @ 16c lb. for spot material. Producers still hope to increase production sufficiently to meet the situation but at

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	27.00	Important shipment....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls				
.42	.42	.42	.42	.....lb.	.....	.42	.42	.42
.50	.50	.50	.50	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.....	.....	.....	.....	Peroxide, 100 lb cs.....lb.	.....	1.25	1.25	1.25
.10½	.09¾	.12½	.09¾	Silicofluoride, bbls.....lb.	.09¾	.10½	.10½	.09¾
.25	.23	.23	.23	Stearate, bbls.....lb.	.25	.26	.26	.25
.24	.24	.24	.24	Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.24	.19
.08½	.08	.08	.08	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.....	.....	.05	.04½	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.50	.35	.....	.....	Ore, powdered or granular				
.03½	.03	.03	.03	75-80%, bbls.....lb.	.03	.03½	.03½	.03
.04½	.04	.04	.04	80-85%, bbls.....lb.	.04	.04½	.04½	.04
.05½	.05	.05	.05	85-88%, bbls.....lb.	.05	.05½	.05½	.05
.07½	.07	.07	.07	Sulfate, 550 lb drs NY.....lb.	.08	.08½	.08½	.08
Nom.	.03½	.03½	.03½	Mangrove 55%, 400 lb bbls...lb.	.03½	Nom.	Nom.	.03½
45.00	39.000	034.00	0 1 3.	Bark, African.....ton	.....	30.00	35.00	30.00
12.00	10.00	10.00	5 .	Marble Flour, bulk.....ton	14.00	15.00	15.00	14.00
				Mercurous chloride .....lb.	.....	2.05	2.05	2.05
132.00	121.00	129	99.00 .00	Mercury metal.....75 lb flask	125.00	126.00	126.00	120.00
.74	.72	.72	.72	Meta-nitro-aniline.....lb.	.70	.72	.74	.70
1.80	1.50	1.70	1.70	Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.50	1.55	1.55	1.50
.94	.90	.90	.90	Meta-phenylene-diamine 300 lb. bbls.....lb.	.84	.90	.90	.84
.74	.72	.72	.72	Meta-toluene-diamine, 300 lb bbls.....lb.	.70	.72	.72	.70
				Methanol				
.58	.46	.80	.55	Methanol, (Wood Alcohol),.... 95%.....gal.	.55	.60	.65	.55
.60	.47	.87	.57	97% .....gal.	.57	.62	.65	.57
.63	.44	.....	.....	Pure, ...gal.	.60	.65	.68	.60
.58	.48	.....	.....	Synthetic, drums c-l.....gal.	.63	.66	.66	.63
.75	.45	.80	.75	Denat. gre. tanks.....gal.	.60	.62	.62	.60
.95	.95	.95	.95	Methyl Acetate, drums.....gal.	.....	.95	.95	.95
.90	.68	.88	.75	Acetone, 100 gal drums...gal.	.83	.85	.85	.83
.95	.85	1.00	.85	Anthraquinone, kegs.....lb.	.85	.95	.95	.85
.....	.....	.....	.....	Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.60	.55
60	.55	.55	55	Chloride, 90 lb cyl.....lb.	.55	.60	.....	.....
				Furoate, tech., 50 gal. dr., .lb.	.....	.50	.50	.50
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65.00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
.75	.70	.70	.70	Monochlorobenzene, drums see, Chorobenzene, mono.....lb.	.70	.75	.75	.70
1.05	1.05	1.05	1.05	Monoethylorthotoluidin, drs. lb. Monomethylaniline, 900 lb dr .....lb.	.....	1.05	1.05	1.05
4.20	3.95	3.95	3.95	Monomethylparaminosufate 100 lb drums.....lb.	3.95	4.20	4.20	3.95
.07	.06½	.06½	.06½	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.04½	.04½	.04	.04	Myrobalans 25%, liq bbls....b	.04½	.04½	.04½	.04½
.08½	.08	.08	.08	50% Solid, 50 lb boxes.....lb.	.08	.08½	.08½	.08
50.00	42.00	43.50	41.00	J1 bags.....ton	.....	42.00	43.00	40.00
40.00	32.50	37.00	23.50	J 2 bags.....ton	.....	29.00	40.00	29.00
40.00	32.50	37.00	30.00	R 2 bags.....ton	.....	29.00	34.00	29.00
.18	.18	.21	.18	Naphtha, v. m. & p. (deodorized) bbls.....gal.	.....	.16	.18	.16
.06	.05½	.06	.05½	Naphthalene balls, 250 lb bbls wks.....lb.	.....	.05½	.05½	.05½
.04½	.04½	.04½	.04½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.05	.05	.05	.04½	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.24	.21	.21	.21	Nickel Chloride, bbls kegs....lb.	.21	.24	.24	.21
.38	.35	.35	.35	Oxide, 100 lb kegs NY.....lb.	.37	.40	.40	.37
.09¾	.09	.09	.08½	Salt bbl. 400 bbls lb NY...lb.	.....	.13	.13	.13
.09	.08¾	.08¾	.08	Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
1.30	1.25	1.25	1.10	Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.30	1.25
1.20	.98½	1.10	1.10	Sulfate, 10 lb tins.....lb.	.98½	1.20	1.20	.98½
14.00	13.00	13.00	13.00	Nitre Cake, bulk .....ton	16.00	18.00	18.00	12.00
.10½	.10½	10½	.09½	Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.10½	.10½	.10½	.10½
Nom.	.40	.40	.40	Nitrocellulose, regular drums wks.....lb.	.40	Nom.	Nom.	.40
				Low viscosity (soln only)				
Nom.	.55	.55	.55	Grade 1 drums, wks.....lb.	.55	Nom.	Nom.	.55
Nom.	.50	.50	.50	Grade 2 drums, wks.....lb.	.50	Nom.	Nom.	.50
4.00	3.35	3.60	3.35	Nitrogenous Material, bulk..unit	.....	3.65	4.00	3.65
.25	.25	.25	.25	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
.15	.14	.14	.14	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
Nom.	.25	.25	.25	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
.18	.17	.17	.17	Chinese, bags.....lb.	.12	.13	.13	.12
.24	.22	.22	.22	Powdered, bags.....lb.	.22	.24	.24	.22
.03½	.03½	.03½	.03½	Oak, tanks, wks.....lb.	.....	.03½	.03½	.03½
.04½	.04	.04	.04	23-25% liq., 600 lb bbl wk lb.	.04	.04½	.04½	.04
50.00	45.00	45.00	45.00	Oak Bark, ground.....ton	30.00	35.00	50.00	30.00
23.00	20.00	20.00	20.00	Whole.....ton	20.00	23.00	23.00	20.00
.13½	.13	.14½	.13	Orange-Mineral, 1100 lb casks NY.....lb.	.12½	.13½	.13½	.12½
2.25	2.20	2.20	2.20	Orthoaminophenol, 50 lb kgs..lb.	2.20	2.25	2.25	2.20
2.50	2.35	2.50	2.35	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
.65	.50	.50	.50	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.28	.18	.18	.18	Orthocresol, drums.....lb.	.18	.28	.28	.18
.07	.06	.06	.06	Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.10	.07
.35	.32	.32	.32	Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	30	.33	.33	.30



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present are unable to tell when this will materialize.

Rosin — Abundant stock, coupled with but light demand, accounted for the decline in prices extending over most grades during the past month. The surprising thing is that the market has held up so well in the face of a weak statistical position. In fact, some evidences of strength were seen toward the turn of the month.

Salt Cake — Supplies are apparently becoming increasingly limited and prices have a strong upward tendency. In the first six months of the current year preliminary figures show imports of salt cake at 46,863 short tons as compared with the entire year 1928, imports of 28,228 tons and a 1927 total of 11,171 tons. At this rate, the 1929 imports of this chemical bid fair to equal 100,000 tons. Over 56 per cent of the shipments this year were shown as originating in the Netherlands and 38 per cent in Germany with the balance from Canada. Since Germany is known to be the primary source of cheap salt cake, it is not improbable that much of these imports shown as originating from the Netherlands were transhipments from Germany.

Shellac — The month generally was a good one in this market. The demand held up fairly well for this season of the year and the market seemed strong. Accordingly prices advanced somewhat over those which prevailed when last reported. Bone dry is now at 58c lb., garnet at 45c lb., superfine at 47½c @ 48c lb., and T. N. at 44½c @ 45c lb. An improvement in the Indian export trade in shellac is shown by the fact that exports for the first four months of this year amounted to 201,000 cwts., a figure 76,000 cwts more than the total exports for 1928 and 71,000 cwts more than the 1927 total. The main deliveries went to North America which took 96,000 cwts to the end of this April, the United Kingdom's share in the trade amounting to 58,000 cwts.

Soda Ash — Domestic movement of this material has held up better than expected during the summer months. Good demand has been experience from the glass industry, while the export demand has also been heavy.

Soda Caustic — Both domestic and foreign demands have continued unexpectedly heavy during the summer months and business generally has been in heavy volume. United States exports of caustic soda for the first half of 1929 increased $165,000 over the value exported during the first half of 1928. The Far East with $91,000 greater purchases and

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.18	.17	.13	.13	Orthonitrotoluene, 1000 lb drs wk.....lb.	.17	.18	.17
.90	.85	.85	.85	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.90	.85
.31	.29	.29	.25	Orthotoluidine, 350 lb bbl lc-l lb.	.25	30	.30	.25
.75	.70	.70	.70	Orthonitroparachlorphenol, tins .....lb.	.70	.75	.75	.70
.17	.16	.16	.16	Osage Orange, crystals.....lb.	.16	.17	.17	.16
.07	.07	.07	.07	51 deg. liquid.....lb.	.07	.07½	.07½	.07
.15	.14½	.14½	.14½	Powdered, 100 lb bags.....lb.	.14½	.15	.15	.14½
.06¼	.06¼	.06¼	.06¼	Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P.....lb.	.06	.06¼	.06¼	.06¼
.07¼	.07¼	.07¼	.07¼	128-132 deg. M. P.....lb.	.06¼	.06¼	.07	.06¼
.08¼	.08	.08	.08	133-137 deg. M. P.....lb.	.07¼	.07¼	.07¼	.07¼
.10	.08¼	.08¼	.08¼	138-140 deg. M. P.....lb.	.08	.09	.09	.08
.28	.20½	.29	.26	Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.28	.20½
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05	1.00
1.30	1.25	1.25	1.25	Aminohydrochloride, 100 lb kegs.....lb.	1.25	1.30	1.30	1.25
1.15	1.15	1.15	1.15	Aminophenol, 100 lb kegs..lb.	.99	1.02	1.15	.99
.65	.50	.50	.50	Chlorophenol, drums.....lb.	.50	.65	.65	.50
.....	.....	.12	.12	Coumarone, 330 lb drums..lb.	.....	.....	.....	.....
2.50	2.25	2.25	2.25	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50	2.25
.20	.17	.17	.17	Dichlorobenzene, 150 lb bbls wks.....lb.	.17	.20	.20	.17
.55	.50	.53	.50	Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55	.50
.59	.48	.52	.52	Nitroaniline, 300 lb bbls wks .....lb.	.48	.59	.49	.48
.32	.32	.32	.32	Nitrochlorobenzene, 1200 lb drs wks.....lb.	.23	.26	.26	23
2.85	2.75	2.75	2.75	Nitro-orthotoluidine, 300 lb bbls.....lb.	2.75	2.85	2.85	2.75
.55	.50	.50	.50	Nitrophenol 185 lb bbls....lb.	.50	.55	.55	.50
.94	.92	.92	.92	Nitrosodimethylaniline, 120 lb. bbls.....lb.	.92	.94	.94	.92
.30	.30	.30	.25	Nitrotoluene, 350 lb bbls....lb.	.....	.30	.30	.30
1.20	1.15	1.20	1.15	Phenylenediamine, 350 lb bbls .....lb.	1.15	1.20	1.20	1.15
.41	.40	.40	.40	Toluenesulfonamide, 175 lb bbls.....lb.	.70	.75	.75	.70
.22	.20	.20	.18	Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.22	.20
.42	.40	.45	.38	Toluidine, 350 lb bbls wk...lb.	.40	.42	.42	.40
.25	.20	.21	.21	Paris Green, Arsenic Basis 100 lb kegs.....lb.	.....	.27	.27	.25
.23	.17	.19	.19	250 lb kegs.....lb.	.....	.25	.25	.23
.....	.....	.25	.25	Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	.25
.03	.02½	.02½	.02½	Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02½	.02
.13	.20	.18	.16	Phenol, 250-100 lb drums.....lb.	.14¾	.15	.16	.13
1.35	1.35	1.35	1.28	Phenyl - Alpha - Naphthylamine, 100 lb kegs.....lb.	.....	1.35	1.35	1.35

Phosphate

				Phosphate Acid (see Superphosphate)			
				Phosphate Rock, f.o.b. mines			
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15	3.00
3.65	3.50	3.50	3.50	70% basis.....ton	3.75	4.00	4.00	3.50
4.15	4.00	4.00	3.85	72% basis.....ton	4.25	4.50	4.50	4.00
5.00	5.00	5.35	5.00	75-74% basis.....ton	5.25	5.50	5.50	5.00
5.75	5.75	5.75	5.60	75% basis.....ton	.....	5.75	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis.....ton	.....	6.25	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis.....ton	.....	5.00	5.00	5.00
.40	.35	.35	.35	Phosphorous Oxychloride 175 lb cyl.....lb.	.35	.40	.40	.35
.65	.60	.65	.60	Red, 110 lb cases.....lb.	.55	.60	.60	.55
.32	.32	.32	.32	Yellow, 110 lb cases wks..lb.	.....	.32	.32	.32
.46	.46	.46	.46	Sesquisulfide, 100 lb cs.....lb.	.....	.44	.46	.44
.....	.....	.35	.35	Trichloride, cylinders.....lb.	.....	.35	.35	.35
.20	.18	.18	.18	Phthalic Anhydride, 100 lb bbls wks.....lb.	.18	.20	.20	.18
45.00	37.00	40.00	37.00	Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	45.00	37.00
.64	.63	.63	.63	Pine Oil, 55 gal drums or bbls Destructive dist.....lb.	.63	.64	.64	.63
10.60	8.00	8.00	8.00	Prime bbls.....bbl.	8.00	10.60	10.60	8.00
.70	.70	.70	.66	Steam dist. bbls.....gal.	.65	.70	.70	.65
45.00	40.00	40.00	40.00	Pitch Hardwood, wks.....ton	40.00	45.00	45.00	40.00
3.30	3.30	3.30	3.30	Plaster Paris, tech, 250 lb bbls .....bbl.	3.30	3.50	3.50	3.30

Potash

.07½	.07½	.07½	.07½	Potash, Caustic, wks.....lb.	.....	.07½	.07½	.07½
.07½	.07½	.07½	.07½	Imported casks c-l.....lb.	.....	.07½	.07½	.07½
				Potash Salts, Rough Kainit			
9.00	9.00	9.00	9.00	12.4% basis bulk.....ton	.....	9.10	9.10	9.00
9.50	9.50	9.50	9.50	14% basis.....ton	.....	9.60	9.60	9.50
				Manure Salts			
12.40	12.40	12.40	12.40	20% basis bulk.....ton	.....	12.50	12.50	12.40
18.75	18.75	18.75	18.75	30% basis bulk.....ton	.....	18.95	18.95	18.75
36.40	36.40	36.40	36.40	Potassium Muriate, 80% basis bags.....ton	.....	36.75	36.75	36.40
27.00	27.00	27.00	27.00	Pot. & Mag. Sulfate, 48% basis bags.....ton	.....	27.50	27.50	27.00
47.30	47.30	47.30	47.30	Potassium Sulfate, 90% basis bags.....ton	.....	47.75	47.75	47.30
.09½	.09	.09	.09	Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.13	.14	.14	.13
.09½	.08½	.08½	.08	Bichromate Crystals, 725 lb casks.....lb.	.09	.09½	.09½	.09
.12½	.12	.12	.11	Powd., 725 lb cks wks....lb.	.13	.13½	.13½	.13

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

South America with nearly $68,000 more than in the preceding half year period were outlets for the bulk of the increased purchases. The North and Central American group took over $18,000 more caustic and in Europe where the United States shipped only about $2,700 worth in 1928, the sales for half of the current year were over $11,000. The value of the caustic soda exports to the world divisions for the half year periods was as follows: Europe, 1928, $2,657, 1929, $11,390; North America, 1928, 487,929, 1929, 506,316; South America, 1928, 422,825, 1929, 490,591; Far East, 1928, 760,482, 1929, 851,561; Africa, 1928, 17,813, 1929, 16,725; Total 1928, 1,711,706, 1929, 1,876,583. The larger gains were in Canada, Netherland. West Indies, Argentina, Philippine Islands, China, and British India. The most conspicuous loss was about $87,000 of the previous half year's trade with Brazil.

Sodium Nitrate — The market continues dull, without any new developments, current business being confined to the sale of scattered carloads spot and nearby, with futures entirely neglected, which is not surprising this time of the year. Increase activity is not likely until September or October, when buyers may be able to more accurately estimate their future requirements. Meanwhile, importers are holding firm with prices unchanged, namely, 95 per cent in 100 ton lots or more, September $2.09, October $2.11, November $2.12, December $2.13, January $2.14, February/June monthly inclusive $2.16, with 2c per 100 lbs. additional, in lots of less than 100 tons, ex vessel usual ports, subject to change. The present outlook is for dearer freights later on, and coupled with the Fall demand, may have the effect of advancing values. Shipments of nitrate of soda from the West Coast during July were as follows: 129,000 tons shipped to Europe, 36,000 tons shipped to United States Atlantic, 34,800 tons shipped to various countries, 8,300 tons shipped to United States Pacific. The production during July amounted to 267,422 tons, against 260,157 tons in July, 1928.

Sodium Phosphate — Is meeting with broader demand as a result of a resumption of activity in some branches of the textile industry. The tri-grade is moving in good volume to manufacturers of household cleansers. Prices are well maintained.

Superphosphate — Activity has been at a low ebb during the past month with quotations continuing at $9.50 per ton.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls....lb.	.16	.17	.16
.30	.30	.30	.30	Bisulfate, 100 lb kegs....lb.	.....	.30	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks....lb.	.05½	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks....lb.	.08½	.09	.09	.08½
.08½	.07½	.08½	.08½	Imported 112 lb kegs NY....lb...	.07½	.07½	.07½	.07½
.05½	.05½	.05½	.05½	Chloride, crys bbls....lb.	.05¼	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs....lb.	.27	.28	.28	.27
.57½	.55	.55	.55	Cyanide, 110 lb. cases....lb.	.55	.57½	.57½	.55
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13	.11½
.17	.16	.16	.16	Oxalate, bbls....lb.	.20	.24	.24	.16
.12	.11	.11	.11	Perchlorate, casks wks....lb.	.11	.12	.12	.11
.15½	.15	15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks....lb.	.16	.16½	.16½	.16
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	.38	.40	.40	.38
.18½	.18	.18	.18	Yellow, 500 lb casks....lb.	.18½	.21	.21	.18½
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.25	.21
.. ..	.. ..	.....	.. ..	Propyl Furoate, 1 lb tins....lb.	.....	5.00	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags....lb.	.04	.05	.05	.04
.06	.04½	.04½	.04½	250 lb bbls....lb.	.04½	.06	.06	.04½
.03	.02½	02½	.02½	Powdered, 350 lb bags....lb.	.02½	.03	.03	.02½
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½	.03½
.07	.05½	5.50	5.50	Linseed Oil, kegs....100 lb.	.....	.05½	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums....gal.	.....	1.75	1.75	1.50
.13	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk....unit	.13	.13¼	.13¼	.13
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03½	.04	.04	.03½
.04	.03½	.03½	.03½	450 lb bbls c-l....lb.	.03½	.04½	.04½	.03½
.05	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½	.05½
.05	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05½	.05½	.05½	.05½
.05	.05	.05	.05	Clarified, 64%, bales....lb.	.....	.05½	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls....lb.	.05½	.06	.06	.05½
.13	.10	.10	.10	Solid, 100 lb boxes....lb.	.10	.13	.13	.10
14.00	14.00	14.00	14.00	Bark, Rough....ton	.....	14.00	14.00	14.00
35.00	34.00	34.00	34.00	Ground....ton	34.00	35.00	35.00	34.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks....lb.	.45	.46	.46	.45
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans....lb.	1.15	1.25	1.25	1.15
.57	.57	.67	57	Rosin Oil, 50 gal bbls, first run ....gal.	.....	.62	.62	.57
.62	.62	72	62	Second run....gal.	.....	.64	.64	.62
				Rosin				
9.75	8.20	13.00	8 50	Rosins 600 lb bbls 280 lb...unit B....	.....	8 55	8.55	7.45
9.80	8.25	13.00	8.50	D....	.....	8.57½	8.65	7.70
9.95	8.60	13.15	8.50	E....	.....	8.57½	9 10	8.30
10.10	8.65	13.20	8.50	F....	.....	8.60	9 30	8.40
10.10	8.75	13.25	8.50	G....	.....	8.60	9.45	8.40
10.10	8.75	13.30	8 50	H....	.....	8.60	9.50	8 40
10.15	8.80	13.35	8.55	I....	.....	8.60	9 50	8.40
10.15	8.85	14.80	8 65	K....	.....	8.65	9 55	8.45
10.30	8.85	15.00	8.80	M....	.....	8 65	9 85	8.50
11.00	9.15	15.85	9.15	N....	.. ..	8.93	10 30	8.93
11.65	10.15	16.60	10.50	WG....	.....	9.00	11.30	9.00
12.65	10.40	18.55	12.00	WW....	.....	9.30	12.30	9.30
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.08	.07	.07	.07	Lump, imported, bbls....lb.	.07	.08	.08	.07
.12	.09	.09	.09	Selected bbls....lb.	.09	.12	.12	.09
.05	.02	.02	.02	Powdered, bbls....lb.	.02	.05	.05	.02
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags....lb.	.04½	.05	.05	.04½
.....	.....	.90	.90	Sal Soda, bbls wks....100 lb.	.....	1.00	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-l wks..ton	19.00	21.00	21.00	19.00
17.00	15.00	15.00	15.00	Chrome ....ton	12.00	15.00	17.00	12.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls....lb	.06½	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls....lb	.....	.01½	.01½	.01½
.62½	.49	.66	.47	Shellac Bone dry bbl....lb.	.....	.58	.61	.55
.55	.45	.57	.41	Garnet, bags....lb.	.. ..	.45	.45	.43
.58	.47	.65	40	Superfine, bags....lb.	.47½	.48	.47	.45
.55	.42	.37	.57	T. N. bags....lb.	.. 44½	.45	.44	.41
.57	.53	.50	.50	Schaeffer's Salt, kegs....lb.	.53	57	.57	.53
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
30.00	22.00	15.00	15.00	Refined, floated bags....ton	22.00	30.00	30.00	22.00
.....	.....	32.00	32.00	Air floated bags....ton	.....	32.00	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags....ton	32.00	40.00	40.00	32.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines....ton	15.00	22.00	22.00	15.00
				Soda				
1.40	1.40	1.32½	1.32½	Soda Ash, 58% dense, bags c-l wks....100 lb.	.....	1.40	1.40	1.40
2.29	2.40	2.14	2.04	58% light, bags....100 lb.	.....	1.34½	1.34½	1.34½
1.32½	1.32½	1.32½	1.32½	Contract, bags c-l wks.100 lb.	.....	1.32	1.32	1.32
4.21	4.16	4.16	4.06	Soda Caustic, 76% grnd & flake drums....100 lb.	.....	3.35	3.35	3.35
3.91	3.76	3.76	3.66	76% solid drs....100 lb.	.....	2.95	2.95	2.95
3.00	3.00	3.00	3.00	Contract, c-l wks....100 lb.	.....	2.90	2.90	2.90
.05	.04½	.04½	.04½	Sodium Acetate, crystals, 450 lb. bbls wks....lb.	.06½	.06½	.06½	.05
.....	.....	.19	.18	Arsenate, drums....lb.	.18	.19	.19	.19
.....	.....	1.00	1.00	Arsenite, drums....gal.	1.00	1.50	1.50	1.00
2.41	2.41	2.41	2.41	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

Production of bulk superphosphate during June, as reported to the Department of Commerce by 80 concerns operating 172 plants, was 370,480 tons, as compared with 345,916 tons during May. The output of base and mixed goods amounted to 43,961 tons, compared with 63,634 tons in May, Stocks of superphosphate at the end of June were 850,301 tons, compared with 712,484 tons at the end of May.

Tankage — Heavy demand for feeding brought a note of increased activity into this market and noticeably stimulated business. Prices in the New York market advanced to $4.35 & 10 per unit.

Turpentine — Although most of the month was dull in this market, there was a strong reaction upwards towards the close of the month which put the market in much more favorable position. Prices, which had been lower, advanced to the same level as they held when last reported.

Zinc — Stocks of slab zinc in hands of American producers were, according to American Zinc Institute, 44,122 short tons August 1 compared with 36,932 tons July 1, increase of 7,190 tons. Production for July came to 54,441 tons and shipments were 47,251 tons. Of the total shipments 681 tons were for export and 46,570 for domestic consumption.

OILS AND FATS

Chinawood Oil — An easier tone has prevailed in this market during the past month, and as a result prices are considerably lower, tanks at the Coast being at 13c lb., or ½c lb. lower than when last reported. Total tung oil shipments from Hankow during July aggregated 11,700, 320 pounds, of which 10,616,160 went to the United States and 1,084,160 pounds to Europe. It was estimated that the unsold stocks of oil at Hankow the end of July were approximately 4,100 short tons but the trade reports 800 short tons of this quantity is not suitable for export. A decrease occurred in exports of oil during July both as compared with June when shipments amounted to 17,883,200 pounds, of which 16,472,000 pounds went to the United States; as well as with July of last year when exported amounted to 14,231, 140 pounds, of which 12,272,260 pounds went to the United States. Total shipments to the United States for the first seven months of this year amount to 64,853,625 pounds, which compares with 58,983,925 pounds for the same period of last year.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06½	.06½	.06½	Bichromate, 500 lb cks wks.lb.	.07½	.07½	.07½	.07½
.04	.04	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35	1.30
.06½	.05½	.06½	.06½	Chlorate, ... wks..lb.	.10	.11	.11	.06½
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00	12.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20	.18
.09	.08½	.08½	.08½	Fluoride, 300 lb bbls wks...lb.	.08½	.09	.09	.08½
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24	.22
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.65	3.05	3.05	2.65
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65	2.40
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½	.02½
.57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.55	.57	.57	.55
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	.....	2.09	2.22½	2.09
.08½	.07½	.08½	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08	.07½
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27	.25
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42	.37
3.90	3.90	3.90	3.90	Paratoluene, tri-sodium, tech. 100 lb bbls c-1....100 lb.	.....	3.90	3.90	3.90
.09	.08	.08	.08	Sulfonate, 175 lb bbls....lb.	.08	.09	.09	.08
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22	.18
3.55	3.25	3.25	3.25	Phosphate. di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55	3.25
.....	.....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00	3.90
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72	.69
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½	.12
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20	.15
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.55	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80	.70
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05½	.05½	.05½	.05
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.41½	.42	.43	.41½
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	.29	.29	.25
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18	.16
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02½	.02½	.02½
.02½	.02½	.02½	.02½	Sulfide, 30% crystals, 440 lb bbls wks.....lb.	.02½	.02½	.02½	.02½
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb	.03½	.04	.04	.03½
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03½	.03½	.03½	.03½
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.28	.35	.76	.28
.85	.80	.85	.80	Tungstate, tech, crystals, kegs .....lb.	.....	.88	1.40	.88
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40	.35
.01½	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½	.01½
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½	.02
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.82	4.02	4.02	3.82
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.72	3.92	3.92	3.72
.06½	.05½	.06	.04½	Potato, 200 lb bags.....lb.	.05½	.06½	.06½	.05½
.06½	.05½	.06½	.06½	Imported bags.....lb.	.05½	.06½	.06½	.05½
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½	08
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10	.09½
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07	.06½
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	.10	.10	.09½
.07½	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½	.07½
.09	.08½	.08½	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09½	.08½
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25
				Sulfur				
2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00	18.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85	2.65
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½	.05
.04½	.03½	.03½	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½	.03½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.08	.08½	.08½	.08
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.17	.19	.19	.17
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65	.10
.11½	.11	.11	.11	Stainless, 600 lb bbls....lb.	.11	.11½	.11½	.11
.06	.05½	.05	.05	Extract, 450 lb bbls.....lb.	.05½	.06	.06	.05½
130.00	130.00	130.00	130.00	Sicily Leaves, 100 lb bg...ton	.....	130.00	130.00	130.00
72.00	72.00	80.00	72.00	Ground shipment.....ton	.....	72.00	72.00	72.00
60.00	55.00	55.00	55.00	Virginia, 150 lb bags.....ton	55.00	60.00	60.00	55.00
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00	12.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00	16.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	20.00	25.00	25.00	20.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	38.00	45.00	45.00	38.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00	40.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00	50.00
				Superphosphate, 16% bulk, wks.....ton	.....	9.50	10.00	9 00

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - July 1929 $1.017

Coconut Oil — Has reacted somewhat from the fairly good position it held when last reported. During the past month the general tone of the market has been easy both here and at the Coast. There has been but little business transacted, with both buyers and sellers showing no interest in futures. The primary market for both the oil and for copra has been steady with offerings fairly light. Prices on all grades have declined during the past month and are now ⅛c @ ½c lb. lower than when last reported.

Cottonseed Oil — Has been easy during the past month with but little activity noted. As a result PSY is down about 6 points from the position reported a month ago. Cottonseed crushed during the cotton year ended July 31 increased approximately 400,000 tons over the preceding year, totaling 5,058,744 tons, against 4,654,017 tons, according to figures compiled today by the Census Bureau. Receipts during the year amounted to 5,082,051 tons, against 4,586,705 tons the year before, and stocks on hand at mills July 31 totaled 41,340 tons, against 21,972 tons on the same date in 1928. Cottonseed products manufactured during the year included 1,603,352,111 pounds of crude oil, against 1,476,609,401 pounds the preceding year; 1,457,864,507 pounds of refined oil, against 1,311,509,019 pounds; 2,280,894 tons of cake and meal, against 2,093,354 tons; 1,367,325 tons of hulls, against 1,320,066 tons; 1,084,644 running bales of linters, against 875,121 bales; 79,363 500-pound bales of hull fiber, against 79,398 bales, and 51,407 500-pound bales of grabbots, moles, etc., against 41,914 bales. Exports of cottonseed products during the eleven months ended June 30 included 20,525,115 pounds of crude oil against 48,228,618 pounds in the same period a year ago; 8,109,387 pounds of refined oil, against 9,661,386 pounds; 28,6264 short tons of cake and meal, against 309,093 tons, and 176,728 running bales of linters, against 182,835 bales.

Linseed Oil — Prices have advanced abnormally during the past month with the result that prices have reached the highest level attained since the early part of 1925. The strong position of the market is due to the unfavorable crop prospects in Argentina and North America, reduced estimates by trade sources of the Argentina surplus available for the remainder of the season and a continued demand for seed in spite of advancing prices. Commercial stocks reported to the Governments of the United States and Canada as of August 3 were

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	4.35&10	4.35&10	4.00&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	3.75&10	4.80&10	3.75&10
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	4.35&10	4.80&10	4.35&10
.05	.04¼	.04¼	.04¼	Tapioca Flour, high grade bgs..lb.	.04¼	.05	.05	.04¼
.04	.03¾	.03¾	.03¾	Medium grade, bags.....lb.	.03¾	.04	.04	.03¾
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29
.08	.07	.07	.07	Coke Oven, tanks wks.....lb.	.07	.08	.08	.07
13.50	13.50	16.00	13.50	Kiln Burnt, bbl.....bbl.	.....	13.50	13.50	13.50
15.00	13.50	18.50	13.50	Retort, bbls.....bbl.	13.50	15.00	15.00	13.50
1.75	1.15	1.15	1.15	Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.75	1.15
2.00	1.50	1.50	1.50	No. 2 bags or bbls...100 lb.	1.50	2.00	2.00	1.50
.02½	.02	2.00	2.00	Imported bags.....100 lb.	.02	.02½	.02½	.02
.....	.....	.....	.....	Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09½	.09
.20	.20	.20	.20	Tetralene, 50 gal drs wks.....lb.	.....	.20	.20	.20
.24	.22	.22	.22	Thiocarbanilid, 170 lb bbl....lb.	.22	.24	.24	.22
.17½	.14½	.20½	.17½	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.14¾	.14¾	.14
.41½	.36½	.48	.41½	Crystals, 500 lb bbls wks...lb.	.35½	.38	.38	.34½
.58	.48	.71½	.58	Metal Straits NY.....lb.	.....	.46½	.48	.43¾
.75	53	.75	.70	Oxide, 300 lb bbls wks.....lb.	.....	.49	.56	.49
.35½	.30½	.48	.35½	Tetrachloride, 100 lb drs wks. .....lb.	.....	.29¾	.30½	.28¾
.40	.40	.40	.40	Titanium Oxide300 lb bbl....lb.	.....	.24	.40	.24
.14	.13½	.13½	.13½	Pigment, bbls.....lb.	.08¼	.09	.14	.08½
.45	40	.40	.40	Toluene, 110 gal drs.....gal.	.....	.45	.45	.45
.45	.35	.35	.35	8000 gal tank cars wks....gal.	.....	.40	.40	.40
.94	.90	.90	.90	Toluidine, 350 lb bbls.....lb.	.90	.94	.94	.90
.32	.31	.31	.31	Mixed, 900 lb drs wks.....lb.	.31	.32	.32	.31
.90	.85	.85	.85	Toner Lithol, red, bbls.....lb.	.90	.95	.95	.85
.80	.70	.75	.75	Para, red, bbls.....lb.	.....	.80	.80	.70
1.80	1.70	1.75	1.75	Toluidine.....lb.	1.50	1.55	1.55	1.50
3.90	3.60	3.60	3.60	Triacetin, 50 gal drs wks.....lb.	3.60	3.90	3.90	3.60
.....	.....	.....	.....	Trichlorethylene, 50 gal dr...lb.	.10	.10½		
.....	.....	.....	.....	Triethanolamine, 50 gal drs...lb.	.55	.60	.60	.55
.50	.36	.36	.36	Tricresyl Phosphate, drs.....lb.	.33	.45	.45	.33
.73	.69	.70	.69	Triphenyl guanidine.....lb.	.58	.60	.70	.58
.75	.70	.70	.70	Phosphate, drums.....lb.	.60	.70	.75	.60
3.00	2.50	2.50	2.50	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	2.00	1.75
.66½	.50½	.86	.53½	Turpentine Spirits, bbls.....gal.	.52	.58	.65	.51¼
.59	.46	.76	.46	Wood Steam dist. bbls....gal.	.....	.49	.57	.49
.20	.18	.18	.18	Urea, pure, 112 lb cases.....lb.	.20	.30	.30	.20
				Fert. grade, bags c.i.f.....ton	.....	99.00	99.00	98.00
				c. i. f. S. points.....ton	.....	100.30	100.30	99.30
76.00	55.00	70.00	66.00	Valonia Beard, 42%, tannin bags.....ton	.....	46.00	55.00	46.00
55.00	58.00	49.50	39.00	Cups, 30-31% tannin.....ton	.....	32.00	35.00	31.00
64.00	45.00	68.00	43.00	Mixture, bark, bags.....ton	.....	37.00	43.00	37.00
2.10	1.75	1.95	1.55	Vermillion, English, kegs....lb..	2.00	2.05	2.05	2.00
.....	.....	.....	.....	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00	1.00
76.00	49.75	59.00	49.50	Wattle Bark, bags.....ton	48.25	48.50	49.75	43.50
.06½	.05½	.05½	.05½	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½	.06½
1.25	1.25	1.25	1.25	Whiting, 200 lb bags, c-1 wks .....100 lb.	.....	1.25	1.25	1.25
13.00	13.00	13.00	13.00	Alba, bags c-1 NY.....ton	.....	13.00	13.00	13.00
1.35	1.35	1.35	1.35	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35	1.35

Zinc

.05½	5.85	.06½	.06½	Zinc Ammonium Chloride powd., 400 lb bbls.....100 lb.	5.25	5.75	5.75	5.25
.10	.09½	.09½	.09½	Carbonate Tech, bbls NY..lb.	.10½	.11	.11	.10½
.06	.06	.06	.06	Chloride Fused, 600 lb drs. wks.....lb.	.05½	.06	.06	.05½
.06½	.06½	.06½	.06½	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½	.06½
3.00	3.00	3.00	3.00	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00	3.00
.41	.40	.40	.40	Cyanide, 100 lb drums.....lb.	.40	.41	.41	.40
				Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks...lb.	.08½	08¼	.08¼	.08½
6.40	6.07½	7.35	6.40	Metal, high grade slabs c-1 NY.....100 lb.	.....	6 45	6.45	6.45¾
.07¾	.07¾	.07¾	.07¾	Oxide, American bags wks..lb.	.07¾	.07¾	.07¾	.07
.12¾	.10¾	.10¾	.10¾	French, 300 lb bbls wks...lb.	.09¾	.11¾	.11¾	.09¾
.....	.....	.....	.....	Perborate, 100 lb drs.....lb.	.....	1 25	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1 25	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26	.25
.03¾	.03½	.03½	.03	Sulfate, 400 bbl wks.....lb.	.03½	.03¾	.03¾	.03½
.32	.30	.30	.30	Sulfide, 500 lb bbls.....lb.	.30	.32	.32	.30
.30	.29	.29	.29	Sulfocarbolate, 100 lb keg..lb.	.29	.30	.30	.29
.32	.32	.38	.32	Xylene, 10 deg tanks wks...gal.	.....	.33	.33	.33
.32	.30	.36	.30	Commercial, tanks wks...gal.	.30	.32	.32	.30
.38	.38	.35	.35	Xylidine, crude.....lb.	.....	.38	.38	.38
.03	.02½	.02½	.02½	Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.03	.02½
.50	.45	.45	.45	Pure kegs.....lb.	.45	.50	.50	.45
.10	.08	.08½	.08	Semi-refined kegs.....lb.	.08	.10	.10	.08

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½	.13
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13	.12½
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15	.14
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.14¼	.15	.15½	.14½
.14¾	.14¾	.18	.12½	Tanks, spot NY.....lb.	....	.13½	.13¾	.13½
.14¾	.12¾	.....	.....	Coast, tanks, Aug.....lb.	.....	.13	.14¾	.12¾
.11½	.10¾	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10¾	.10¾	.10¾
.10	.09¾	.09¾	.09	Ceylon, 375 lb bbls NY....lb.	.07¾	.08	.09¾	.07¾
.09	.08¾	.08¾	.08	8000 gal tanks NY.....lb.	.06¾	.06¾	.08¾	.06¾
.10¾	.09¾	.10¾	.09½	Cochin, 375 lb bbls NY....lb.	.08¾	.09¾	.10	.09½
.09¾	.08¾	.10	.08½	Tanks NY.....lb.	.....	.08¾	.09¾	.08¾
.10	.08¾	.09¾	.08¼	Manila, bbls NY.....lb.	.07¾	.08¼	.09¾	.07¾
.08¾	.08	.08¾	.08¾	Tanks NY.....lb.	.6¾	.07	.08¾	.06¾
.08¾	.07¾	.08¼	.08	Tanks, Pacific Coast.....lb.	.6¾	.06¾	.08	.06¾

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - July 1929 $1.017

815,000 bushels compared with 1,789,000 bushels at the corresponding time last year and 2,662,000 bushels in 1927. Flaxseed shipments from Argentina during the past two months have been below the corresponding shipments of 1928 but total shipments for the current season to July 20 are well above those of last year. Exports from Argentina, India and Russia from September 1 to July 20 and Canada from September 1 to June 30 were 83,061,000 bushels compared with 78,875,000 bushels exported during the corresponding period last season. Imports into the United States and United Kingdom from September 1 through June 30 were 31,750,000 bushels compared with 27,864,000 bushels last season. Imports into four important continental European countries during the present season continue to be about equal to those of last season. Production of flaxseed in the United States for 1929 based on the crop condition of August 1 is estimated at 18,000,000 bushels compared with July estimate of 19,900,000 bushels and a crop of 18,700,000 bushels in 1928, according to information received by the Foreign Service of the Bureau of Agricultural Economics. No estimate of the 1929 crop of Canada has been issued but the acreage estimate of 384,000 acres is slightly above the 378,081 acres of last year. The condition on August 1 was 65 compared with 91 in July, 1929, and 98 in August, 1928. Flaxseed stocks in the commercial centers reporting to the governments of the United States and Canada on August 3 were 974,000 bushels below stocks reported for the corresponding date last year and 1,847,000 bushels below those of 1927. Stocks reported for the United States were 370,000 bushels compared with 596,000 bushels in 1928 and 884,000 bushels in 1927. Stocks in store in the Western Grain Inspection Division of Canada were 445,000 bushels compared with 1,193,000 in 1928 and 1,778,000 bushels in 1927. The United States continued to take large quantities of flaxseed during June, imports for the month being 2,366,301 bushels compared with 2,517,698 bushels in May, 1929, and 1,644,190 bushels in June, 1928. The total increase over last year to June 30 is not sufficient to balance the shortage in the 1928 crop, however, and imports during July and August must slightly exceed those of June if the supply is to equal that of last season.

Stearic Acid — Prices were advanced ¼c lb. during the past month due to higher prices on basic material. The market was said to be strong with production moving steadily into consuming channels.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	.....gal.	.63	.64	.63
.63	.60	.59	.59	Tanks NY.....lb.	.....	.60	.60	.60
				Cod Liver see Chemicals			
.06½	.05½	.06	.06	Copra, bags.....lb.	.....	.045	.05½	.042
.11	.10	.11	.07	Corn, crude, bbls NY.....lb.	.....	.09½	.10½	.09½
.10	.08½	.09½	.07	Tanks, mills.....lb.	.....	.07½	.09½	.07½
.12½	.11½	.14	.10½	Refined, 375 lb bbls NY....lb.	.....	.10½	.11½	.10½
.11½	.10½	.12	.11	Tanks.....lb.	.....	.09	.11	.09
.09½	.07½	.09½	.06½	Cottonseed, crude, mill.....lb.	.....	Nom.	.09	.08½
10.65	.09½	.11½	.08 1/5	PSY 100 lb bbls spot.....lb.	.....	.092	.1075	.092
10.75	.09½	.....	.....	Sept.—Nov.....lb.	.....	.093	.1080	.093
				Degras, American, 50 gal bbls			
.05	.04½	.04½	.04½	NY.....lb.	.04½	.05	.05	.04½
.05½	.04½	.04½	do	English, brown, bbls NY....lb.	.....	.05½	.05½	.05½
.05½	.05½	.05½	.05½	Light, bbls NY.....lb.	.....	.05½	.05½	.05½
				Greases			
.08½	.07	.07½	.06	Greases, Brown.....lb.	.....	.06½	.08½	.06
.08½	.07	.08	.06½	Yellow.....lb.	.....	.07½	.08½	.06½
.11	.09½	.10½	.08½	White, choice bbls NY.....lb.	.....	.08½	.11½	.07½
.42½	.40	.....	.....	Herring, Coast, Tanks.....gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls.....lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16½	.14½	Lard Oil, edible, prime.....lb.	.....	.14½	.15½	.14½
.13½	.12	.13½	.10½	Extra, bbls.....lb.	.....	.12	.13½	.12
.13	.11	.12½	.10½	Extra No. 1, bbls.....lb.	.....	.11½	.13½	.11½
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots...lb.	.....	.134	.134	.105
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot.....lb.	.....	.13	.13	.101
9.6	8.8	.10½	.09	Tanks.....lb.	.....	.122	.122	.093
.09½	.09½	.09½	.09½	Lumbang, Coast.....lb.	.....	.09½	.09½	.09½
.48	.40	.47½	.44	Menhaden Tanks, Baltimore.gal.	.....	.46	.52	.45
.09	.09	.90	.10	Blown, bbls NY.....lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY..gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY....gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY..gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls			
.60	.40	.....	.....	.....gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal.....gal.	.95	1.00	1.00	.95
.19	.18½	.18½	.14½	Neatsfoot, CT, 20° bbls NY lb.	.....	.18½	.19	.18½
.13½	.12	.13½	.10½	Extra, bbls NY.....lb	.. ..	.12	.13½	.12
.16½	.15½	.16½	.12½	Pure, bbls NY.....lb.	.....	.14	.15½	.13½
.17½	.11½	.18½	.10	Oleo, No. 1, bbls NY.....lb.	.....	.11	.11½	.10½
.15½	.11	.17	.08½	No. 2, bbls NY.....lb.	.....	.10	.11½	.10
.14	.10	.14	.08½	No. 3, bbls NY.....lb.	.....	.09½	.10½	.09½
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY...gal.	1.05	1.15	1.40	1.05
2.00	1.75	2.00	2.45	Edible, bbls NY.....gal.	1.95	2.00	2.00	1.95
.11	.09½	.10½	.08½	Foots, bbls NY.....lb.	.09	.09½	.11½	.09
.09½	.08½	.09½	.09	Palm, Kernel, Casks.....lb.	.....	.08½	.09	.08
.09½	.07½	.08½	.07½	Lagos, 1500 lb casks.....lb.	.....	.07½	.09	.07½
.08½	.07	.08½	.07½	Niger, Casks.....lb.	.....	.07½	.08½	.07½
.12½	.12	.14½	.12	Peanut, crude, bbls NY.....lb.	.....	Nom	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY.....lb.	. 4½	15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY.....lb.	.....	.15	.20	.15
.15½	.10½	.14½	.10	Tanks, Coast.....lb.	.....	.13½	.14½	.13½
1.75	1.70	1.70	1.70	Poppyseed, bbls NY.....gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY...gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY.....gal.	.....	.82	.90	.82
.90	.81	.85	.76	Japanese, drms. NY.....gal.	.....	.78	.88	.78
.10½	.09½	.10	.09	Red, Distilled, bbls.....lb.	.10½	.11½	.11½	.10½
.09½	.08	.09½	.08½	Tanks.....lb.	.....	.09½	.10½	.09½
.5c	.42	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks...gal.	.....	.46	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos...lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos.....lb.	.12½	.12½	.12½	.12½
.40	.40½	.40	.40	Sod, bbls NY.....gal..	.....	.40	.40	.40
.....	.....	.09½	.09½	Soy Bean, crude.....				
.09½	.09	.....	.....	Pacific Coast, tanks.....lb.	.....	.09½	.10	09
				Domestic tanks, f.o.b. mills, ...lb.	.....	.09	.09	.08½
.12½	.12	.12½	.10½	Crude, bbls NY.....lb.	.....	.11½	.12½	.11½
.10½	.10½	.11	.10½	Tanks NY.....lb.	.....	.10½	.10½	.10½
.13½	.13½	.13	.12	Refined, bbls NY.....lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.85	.84	.85	.84	NY.....gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
				Stearic Acid, double pressed dist				
.18½	.11	.13½	.11½	bags.....lb.	.15½	.16	.18½	.15½
				Double pressed saponified bags				
.19	.11½	.14	.11½	.....lb.	.16	.16½	.19	.15½
.20½	.13½	.15½	.13½	Triple, pressed dist bags..lb	.18	.18½	20½	.17½
.12½	.09½	.13	.08½	Stearine, Oleo, bbls.....lb.	.10½	.11	.12	.09½
.09½	.08½	.09	.07½	Tallow City, extra loose.....lb.	.....	.07½	.08½	.07
.10½	.09½	.11	.08½	Edible, tierces.....lb.	.....	.09	.10½	.08
.12½	.11½	.10½	.08½	Tallow Oil, Bbls, c-1 NY...lb.	.....	.10½	.12	.10½
.11½	.10½	.12½	.10	Acidless, tanks NY.....lb.	.....	.09½	.11	.09½
Nom.	.08	.08½	.07½	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
.11	.....	.11	.11	Turkey Red, single bbls.....lb.	.11	.12	.12	.11
.16	.14	.14	.14	Double, bbls.....lb.	.14	.16	.16	.14
				Whale, bleached winter, bbls				
.80	.78	.78	.78	NY.....gal.	.78	.80	.80	.78
.82	.80	.80	.80	Extra, bleached, bbls NY..gal.	.80	.82	.82	.80
.78	.76	.76	.76	Nat. winter, bbls NY.....gal.	.76	.78	.78	.76

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"WE"—Editorially Speaking

Major Donald M. Liddell who tells of chemicals in airplane production, is a chemist and economist, as well as an aviator. For five years he was also associate editor and managing editor of the Engineering & Mining Journal, which qualifies him as a journalist. Since 1916, he has been in consulting practice and is at present partner in the firm of Weld & Liddell, consulting engineers and economists. He is also on the boards of several companies both in this country and abroad. As Captain in the air reserve he saw active service during 1918 and 1919 and at present holds the rank of Major in the air reserve. Previous to his going on active duty, he was chief engineer, War Credits Board. He is a member of the Mining and Metallurgical Society of America, the Institute of Metals (British), American Institute of Mining Engineers, Sons of the American Revolution, Loyal Legion, Military Order of Foreign Wars, Beta Theta Pi, and Phi Beta Kappa. He is the author of Metallurgists & Chemists Handbook, Handbook of Chemical Engineering, Handbook of Non-Ferrous Metallurgy and also numerous articles in various periodicals. He originated the selenium recovery methods in use in copper refineries; several waterproofing methods for stucco work; and the first successful commercial water mix method for magnesium-exichloride stucco.

"Joe" Turner discussing any chemical subject is worth any chemical man's undivided attention. "Joe" Turner on Oxalic Acid is well worth reading. Brought up in the old Riker organization, he went to school in those good old days when a competitor (to put it very mildly) was a "damned pirate" and when a price was not a sales argument but a deadly weapon in a merciless warfare, he has quite literally forgotten more about chemical sales and chemical selling than the present generation of chemical salesmen will ever know. Shrewd, keen, clever, even hard-boiled, are favorite characterizations of him; but we shall never forget a rare compliment that we once heard a big textile buyer pay him: "I have bought hundreds of thousands of dollars worth of chemicals from Joe Turner, over the past twenty odd years, and not a single shipment has been a day later than his promise of delivery and his invoices have always been correct to the last pound and the odd penny."

Kilshaw M. Irwin, who writes on the moot question of purchased vs. generated power, is mechanical engineer of the United Gas Improvement Co., specializing in power station operation and design. He is thus well-fitted to discuss this interesting problem. He received the degree of Ph.B. in mechanical engineering from Sheffield Scientific School in 1915. Previous to his connection with the United Gas Improvement Co. he was successively assistant to research engineer, B. F. Sturtevant Co.; engineer in station betterment division, Stone & Webster Engineering Corp.; consulting engineer, Perry Barker; and chief machinists' mate, in charge of expediting engineering material for destroyers in the 4th Naval District. Since his connection with the U. G. I. he has supervised the operation of power station at Sioux City and East Chicago, Ind.; and had charge of the layout, design and selection of mechanical equipment of Barbadoes Island Plant, Counties Gas & Electric Co., and the Devon Plant, Connecticut Light & Power Co. He is a member of the Prime Movers Committee, National Electric Light Association.

COMING FEATURES

RECENT ECONOMIC CHANGES IN THE CHEMICAL INDUSTRY

Dr. Willard L. Thorp of Amherst begins a series of broad-visioned, practical discussions of the changing structure of our chemical industry. His first article deals with what the new scale of production means to manufacturers.

CHEMICALS IN THE REFRIGERATION INDUSTRY

Dr. J. B. Churchill, refrigerant authority, writes of the contributions of chemical to this industry.

ALUMINUM CHLORIDE IN CARBONIZING WOOL

R. O. Fernandez of the Merrimac Chemical Co., tells of the recent new developments in the use of this chemical by the wool industry.

We stand corrected—a banker with more than a passing knowledge of industrial mergers writes to remind us that in indicating the changed motives in merging we omitted to comment in our editorial last month upon those mergers made, not to spread the manufacturing activities, but to transfer ownership to the public through the sale of securities of corporations formerly held closely. He agrees with us that we cannot count upon a permanently friendly attitude towards Big Business and reckons the change in public sentiment from that coming day of judgment for those companies which have shaped their financial structure solely with the idea of pleasing stock salesmen.

If your craving for speculation is unsatisfied in Wall Street, think out this little problem:—What would happen to the voluntary restriction of the output of alcohol provided there was produced any considerable quantity of synthetic material? Would Dr. Doran raise the limit? Could he forbid the operation of the synthetic process? Would he cut down present quotas to keep the new total within his present limit? In such an event, who would sell whose production?

Ralph H. Dick, who outlines the value of economic research to modern business practice, is president of the Barrington Associates, Inc., which company specializes in the application of such research. He organized this company in New York about three years ago, going to that city from Marietta, Ohio, where he was for twenty years connected with the Safe-Cabinet Co., the last nine of which he was president and general manager.

When we consider the fact that Mr. De Long's article on tariff was prepared soon after the passage of the Hawley Bill and fully a month before the report of the Senate Committee, his words seem almost prophetic and he once more demonstrates the fact that he is one of the country's outstanding authorities on tariff matters.